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ABSTRACT

This module, intended for adult instruction, is an introduction to landscaping designed to help students become familiar with landscaping terminology and concepts. The material is planned for six 2-hour classes. The first three lessons aid students in interpreting landscape plans and understanding some of the reasons for plant placement and selection. They provide a base, which may be built on through future study of plant selection and the principles of landscape design. Lessons 4 and 5 provide practical guidelines for the installation and maintenance of landscape plants. Lesson six provides an introduction into the care of turfgrass. Lessons include an introduction, objectives, student motivation, key points, detailed information (including handouts), group discussion, summary and conclusions, transparency masters, outlines, and supplementary resources and activities. (KC)

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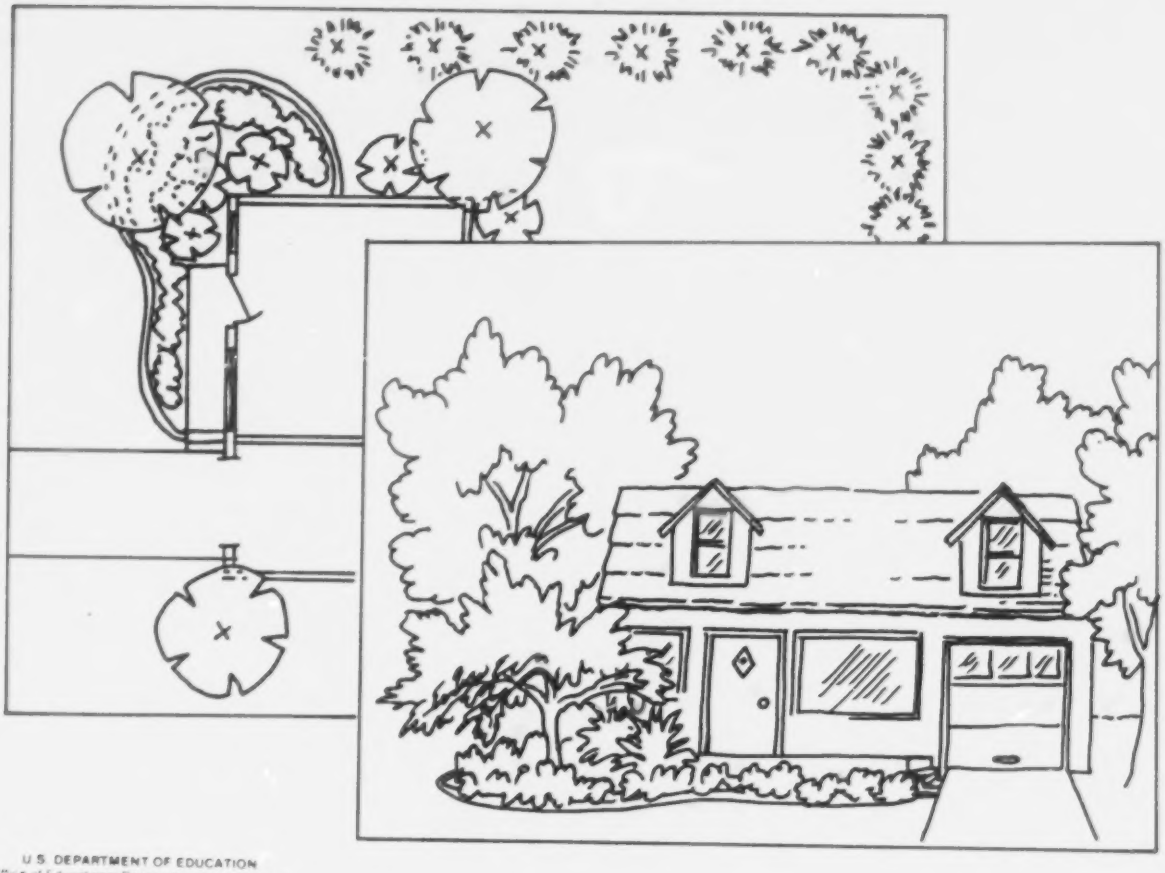
ED 325708

10-2020-I

Introduction to Landscaping (Adult)



Instructor Guide

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Instructor Guide

Introduction to Landscaping
(Adult)

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FOREWORD

The development of the Introduction to Landscaping guide is the result of suggestions by the MVATA Teaching Aids Committee. The Introduction to Landscaping Advisory Committee suggested the topics to be discussed and reviewed the materials.

This unit, which is designed for adult instruction, is meant to be an introduction to landscaping. It should help individuals become familiar with landscaping terminology and concepts. This material is designed for six two-hour classes. It could easily be adapted for a longer course. Transparency masters and Handouts have been included where appropriate. Supplementary resources and activities have been added to the lessons for individuals wanting more information or needing additional activities.

The first three lessons are designed to aid individuals in interpreting landscape plans and understanding some of the reasons for plant placement and selection. They provide a base, which may be built on through future study of plant selection and the principles of landscape design. Lessons four and five provide practical guidelines for the installation and maintenance of landscape plants. Some landscape maintenance may require the assistance of a professional landscaper or nursery person. Lesson six provides an introduction into the care of turfgrass.

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INTRODUCTION TO LANDSCAPING

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    b. #6650 Flowering Perennials: Characteristics and Culture
    c. #6700 Bluegrass and Fescue Lawns - Establishment
    d. #6705 Bluegrass and Fescue Lawns - Maintenance Calendar
    e. #6706 Establishment and Care of Zoysia
    f. #6708 Thatch - Enemy of Lawns
    g. #6750 Lawn and Turf Weed Control
    h. #6880 Understanding Tree and Shrub Problems
    i. #6881 Leaf Scorch of Ornamental Trees and Shrubs

j. #6900 Tree Placement on Home Grounds
k. #6901 Developing the Landscape Plan
l. #6905 Landscaping Your Front Yard (The Public Area)
m. #6910 Landscape Plantings for Energy Savings
n. #6960 Mulches
o. #7356 Elm Leaf Beetle
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1. Elements of Pruning. Vocational Education Productions, 1987. 15 min.
2. Poulan Chain Saw Safety. Poulan. 12 min.
3. Growing Beautiful Lawns. Ortho. 60 min.

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 1: Site Analysis and Basic Landscaping Principles

A. Introduction

This introductory landscaping course covers the following six lessons:

1. Site analysis and basic landscaping principles
2. Plants and hardscapes
3. Selecting plants for the landscape plan
4. Landscape installation and care
5. Landscape maintenance
6. Lawn care

B. Objectives

The student will be able to:

1. Explain why we should landscape home grounds.
2. Show on a landscape drawing how the elements of the site and the person's lifestyle will influence a landscape design.
3. Explain the basic principles of design.
4. Make a rough sketch of his or her home site, illustrating important site considerations.

C. Motivation

1. Show slides of some new homes with attractive landscapes and some that have not been landscaped. Also, show slides of older homes with overgrown plantings and some with well-maintained landscapes. (A landscaper or new building contractor might be a good source for slides showing before and after landscaping.)
2. Ask students if they would like to increase the value of their homes by $5,000/$10,000. Well-landscaped homes have an increased value of 5 to 20 percent.

D. Key Points

1. Why should we plan landscapes?
2. Analyzing the site
3. Identifying use areas
4. Identifying basic elements of design
5. Using flowers in the landscape design
6. Making a rough sketch of a landscape plan

E. Introduction of Information **(Distribute HO 1.1, outline.)**

1. Why should we plan landscapes?

a. A good landscape will tie your home and lawn together. It should improve the looks of your home, just like a new paint job and shutters. A nice landscape will give you pride in your grounds and make your lawn a comfortable place to relax.

b. Your home is a major investment and quality landscaping will increase its value by 5 to 20 percent.

c. A landscape drawing is a long-range guide to follow to alleviate frustrations down the road from plant overcrowding, poor plant selection, and unnecessary maintenance. The

drawing will give you a guide as to what plants to buy and where to locate them.

d. Plants can help reduce energy costs. They can reduce the house temperature in the summer (by providing shade) and reduce cold wind velocity in winter (windbreak).

2. **Analyzing the site (TM 1.1/HO 1.2)**

a. Manmade features
   1) Shape of lot
      (a) Locate your property lines or yard boundaries. These should be drawn to scale (1" = 10' or 1" = 20') on your paper, measuring the width and depth of your yard.
      (b) If your yard is not rectangular, refer to **TM 1.2**.
   2) Location of permanent features (e.g., house, drive, garage, walks, pool, patio)
      (a) Locate permanent features on paper, by measuring from the permanent feature to two of the boundaries.
      (b) If the house is offset, measure from both sides to the boundaries.
   3) Location of utilities (e.g., water, electricity, gas, telephone, TV cable, sewer)
      (a) Underground utilities are important in relation to roots of plants and planting holes. If you are unable to locate them, the utility companies will frequently be willing to locate them for you.
      (b) Overhead utilities are important in relation to branches of shade trees.
      (c) Check on zoning restrictions as to plant selection and placement.

b. Natural features
   1) Physical elements
      (a) Topography and drainage
         (1) With existing lawns, little can be done to make changes without completely reconstructing the lawn. Some drainage work could be done to direct water away from the foundation.
         (2) If a new construction site is being considered, there is still opportunity to do major grading or to make use of topographical features. Try to achieve the recommended slopes.
         (3) Steeper slopes may require the use of ground covers or retaining walls.
         (4) To determine the slope of the grade, determine the number of feet of drop in 100 feet of distance. **(TMs 1.3 and 1.4)**
         (5) Site analysis **(TM 1.1/HO 1.2)**
      (b) Soil
         (1) Consider the depth of soil and bedrock. This will influence the location of trees, etc. Grass should have at least three inches of good topsoil.
         (2) At new construction sites, have the topsoil stockpiled before the basement is dug.
      (c) Present vegetation - Take an inventory of the trees, shrubs, perennials, and grass on the site. Decide whether to keep them, relocate them, or remove them. Consider the ultimate height and spread of plants (mature size). Much maintenance may be eliminated by replacing a fast growing plant with a dwarf variety. Consider that the grade can be raised or lowered to keep an existing plant. **(TM 1.5)**
      (d) Rock formations
         (1) If rock formations are present they may be highlighted to create interesting areas, hidden with screening plants, or removed.
         (2) Rocks uprooted during excavation can be used as interesting features for seating areas or focal points in planting beds.
   2) Environmental elements

(a) Light exposure
(1) Consider what areas of the site are shaded or partially shaded. These areas will need special plant selection. The north and east sides of the home are considered low-light areas.
(2) Also consider how the afternoon sun relates to patio areas.
(b) Airflow
(1) Winter winds usually come from the northwest. These winds can be slowed to reduce snow drifting and fuel bills.
(2) Summer winds usually come from the southwest and you may wish to allow them to blow through the lawn to cool the house.
(3) Low-lying areas tend to accumulate frost. It is better to use plants sensitive to frost higher on a hill.

c. Views
1) On site
(a) Things to be emphasized might include well cared for gardens and rock formations.
(b) Things to be screened may include dog pens, out buildings, and trash areas. Some of these items could be relocated to eliminate the need for screening plants. Plants used for screening help exclude views, sounds, and smells.
2) Off site
(a) Things to be emphasized might include streams, woods, and scenic views.
(b) Things to be screened might include feedlots, parking areas, billboards, unkept buildings or yards, and streets.

d. Family-needs assessment - These are important considerations that must be dealt with before plants can be selected and located on the home site. Maintenance is determined by plant material choice and the landscape design.

NOTE: Have the students take home the needs assessment (HO 1.3). After completing the needs assessment, have them bring it to the next class.

3. **Identifying use areas (TM 1.6)**

NOTE: TM 1.6 is used as an overlay for TM 1.1/HO 1.2.

Cons[illegible]e yard as having three distinct living areas that are an extension of the living areas in th[illegible]e. Each area (public, private, and service/utility) has specific functions.

a. [illegible]ne public area is the area at the front of the house, which is easily seen from the street. This area is very important because it gives people the first impression of the home. It should invite people into the home, not hide it.

b. The private area is the area in the back yard where you can relax or entertain guests. It could include space for decks, barbecuing, outdoor recreation, and swimming.

c. The service/utility area is the work area. It may contain trash cans, clotheslines, storage, vegetable gardens, and dog runs. Frequently this area will be screened off from the rest of the lawn.

4. **Identifying basic elements of design**

Landscaping will help unite the home and lawn together. It will soften the sharp lines of the house and compliment the home.

a. Focal point **(TM 1.7)**
1) This is a point that will attract the eye or attention to a part of the yard. An obvious focal point is the front door of the home. Plants should be used to draw the attention to the door, not away from it. Plants should invite the person in.

2) Birdbaths, statues, and specimen plants are possible focal points. Specimen plants are interesting enough to merit attention on their own.

b. Scale/proportion
   1) Plants in the landscape should be in proportion with the home or buildings. Ranch style homes are best served by small (10'-25') to medium (25'-60') trees. A tall tree (60'-100') will make the house look smaller than it is. **(TM 1.8)**
   2) Plants can be used to make a short house look longer or a long mobile home look shorter. **(TM 1.9)**

c. Repetition **(TM 1.10)** - Repetition is the use of the same plants in different areas of a lawn to tie the landscape together. This does not mean to plant 15 yews in front of a home, but to use the same plants on both sides of the entrance and/or in the back yard.

d. Balance **(TM 1.11)** - Balance in the landscape may be symmetric or asymmetric.
   1) Symmetric balance means one side of the landscape will be just like the other.
   2) Asymmetric balance will not have both sides of the landscape exactly the same. But, it will have equivalent interest on both sides.

e. Variety **(TM 1.12)**
   1) Variety refers to using a variety of plant materials, considering the plant's form, texture, and color. Variety helps avoid monotony and adds interest.
   2) Do not use too many varieties in the lawn. You don't want all of the plants to be different.

f. Sequence **(TM 1.12)** - Arrange the plants in a sequence so that the shorter ones (mature size) are in the front. Placing shorter plants in the back would hide them from view.

g. Contrast **(TM 1.12)**
   1) Contrasting colors, textures, and shape will add interest.
   2) When contrasting colors, consider summer and fall foliage, flower colors, and fruiting habits.
   3) Plants may also be contrasting to buildings.

h. Framing and background planting **(TM 1.13)**
   1) Framing of the home or a view can highlight and emphasize the view.
   2) Background planting - Background planting can emphasize the home by eliminating distracting views.

5. Using flowers in the landscape design (TM 1.14)

a. Annual flowers can provide instant beauty, but they must be replaced each year. Individual flowers can be used to enhance the landscape.
b. Use flowers in masses for high visual impact. It is hard to miss the color from 20-40 plants of one variety planted in mass. Flat quantities of plants can frequently be purchased cheaper.
c. Use annuals in high-traffic areas where they will be seen: around the front entrance, parking areas, or the patio.
d. Perennials will add color and come back year after year.
e. Flowers are essential to make a house into a home.
f. Use plants that will contrast with the home and other landscapes plants.
g. Consider the height of plants when selecting flowers. Put the flowers in sequence with the other landscape plants.

6. Making rough sketches

a. Landscape symbols - Many different symbols are used in landscape design. **TM 1.15/HO 1.4** shows some simple symbols that we will use. **TM 1.16/HO 1.5** illustrates additional symbols you may find on landscape plans.

b. Using a scale **(TM 1.17)**

1) Engineer's scale

(a) Engineer's scales are measured in 1" = 5', 1" = 10', 1" = 20', 1" = 30', 1" = 40', and 1" = 50'.

(b) A scale of 1" = 10' usually works well for home landscaping. On this scale a 50-foot-long house would be 5" long. A tree with a mature spread of 40' would be drawn as a circle with a 4" diameter. The hash marks represent tenths. This tool should help keep your drawings to scale. (A ruler and graph paper may be used successfully.)

2) Architect's scale

(a) Architect's scales are measured in 1/16" = 1', 1/8" = 1', 3/32" = 1', 3/16" = 1', 1/4" = 1', 3/8" = 1', 1/2" = 1', 3/4" = 1', 1" = 1', 1 1/2" = 1', and 3" = 1'.

(b) Determine the appropriate size of scale to use that will fit the drawing on the paper.

c. Site analysis **(TM 1.18)**

NOTE: TM 1.18 is used as the base transparency for TMs 1.19, 1.20, and 1.21.

1) The first drawing to make is a site analysis of the property. Show the location of the property lines, the house, utilities, soil problems, rock formations, and other important site features.
2) Designate north on the drawing.
3) Locate summer and winter winds.
4) Decide what existing vegetation stays.
5) Show good and bad views.

d. Use areas **(TM 1.19)** - Draw three circles to show the use areas (private, public, and service/utility). You may wish to use a transparency or tracing paper.

e. Specific-use areas **(TM 1.20)** - Lightly sketch in the specific-use areas. Designate present and future areas including patios, recreational areas, shrub screens, fruit trees, and planting beds. Refer to the family-needs assessment.

f. Specific planting areas **(TM 1.21)**

1) Locate trees, shrub borders, screens, and planting beds. Put in general ideas of the landscape, showing the basic shapes of planting areas.
2) Once you have learned more about plant materials, you will be able to select specific ones for your drawing.

NOTE: Have the students draw their home sites using graph paper and ruler. Use the 1" = 10' scale.

F. Group Discussion

G. Summary and Conclusions

1. A well-landscaped lawn adds to the beauty and value of your home.
2. The site analysis provides information about the site that is needed to make the landscape drawing.
3. Landscape design is based on a few basic principles, which help tie the plan together.
4.
5.

H. Announcements and Social

I. Materials

1. Instructor

   a. Transparency Masters (TMs 1.1-1.21)

2. Student
   a. Handouts (HOs 1.1-1.5)
   b. Graph paper
   c. Scale or ruler

3. Supplementary Resources

   a. Ingels, Jack E. Landscaping. Albany, NY: Delmar Publishers, Inc., 1983.

   b. O'Banion, B.J. Landscaping Your Home (Teacher Guide). Columbus, OH: Ohio Agriculture Education Curriculum Materials.

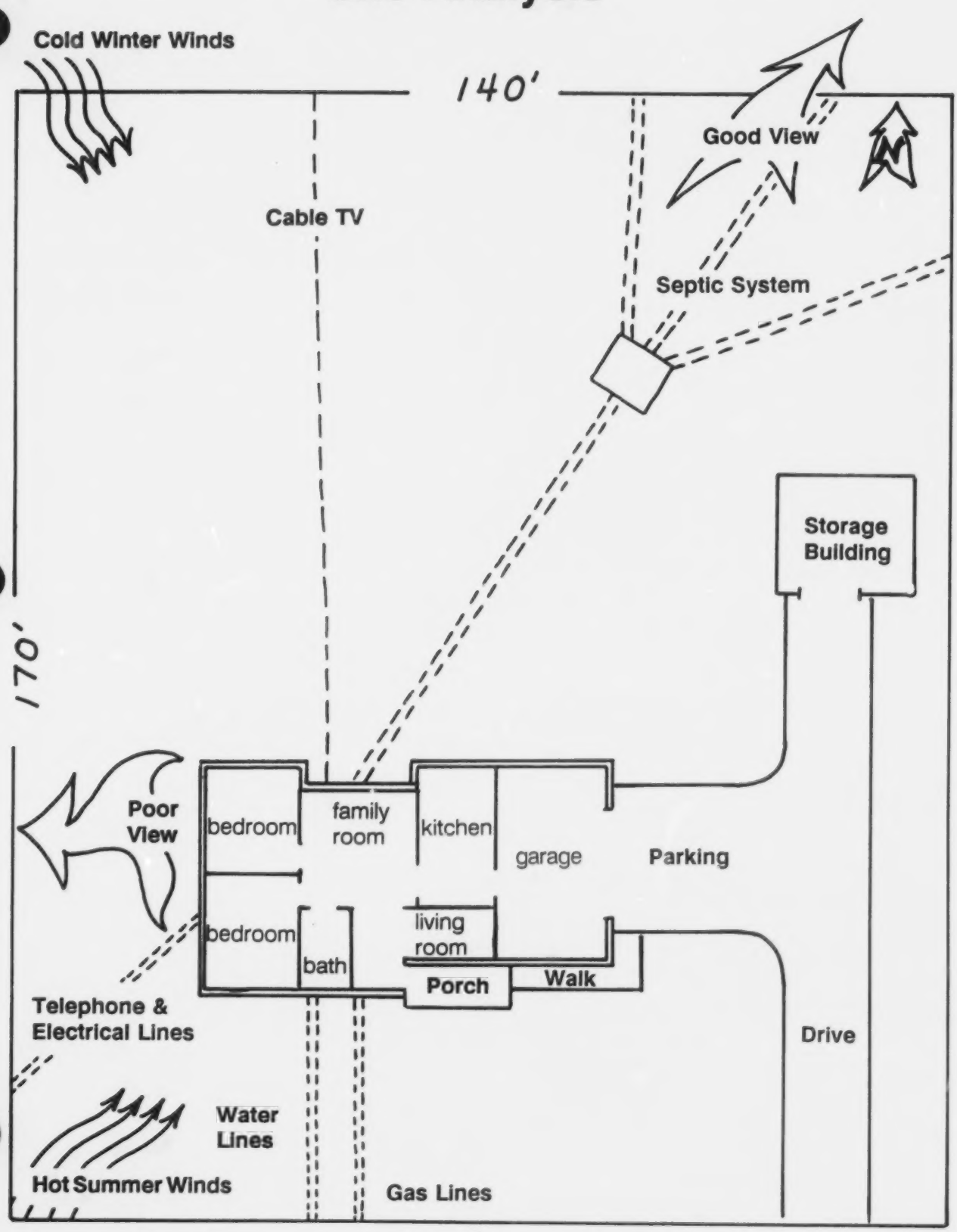
   c. University Extension: University of Missouri-Columbia

      1) #6901 Developing the Landscape Plan
      2) #6905 Landscaping Your Front Yard (The Public Area)

4. Supplementary Activities

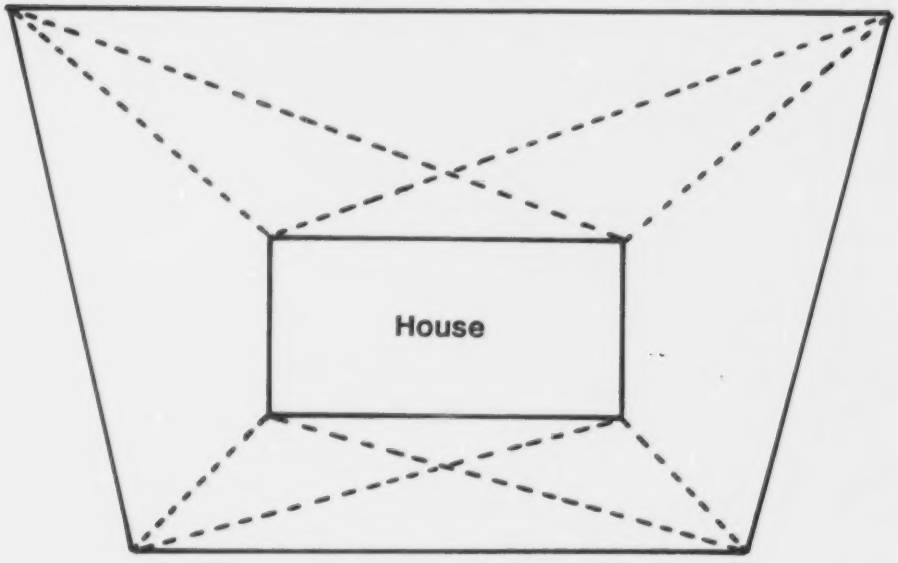
   a. Suggest that students tour lawns around town to get an idea of different landscaping designs.

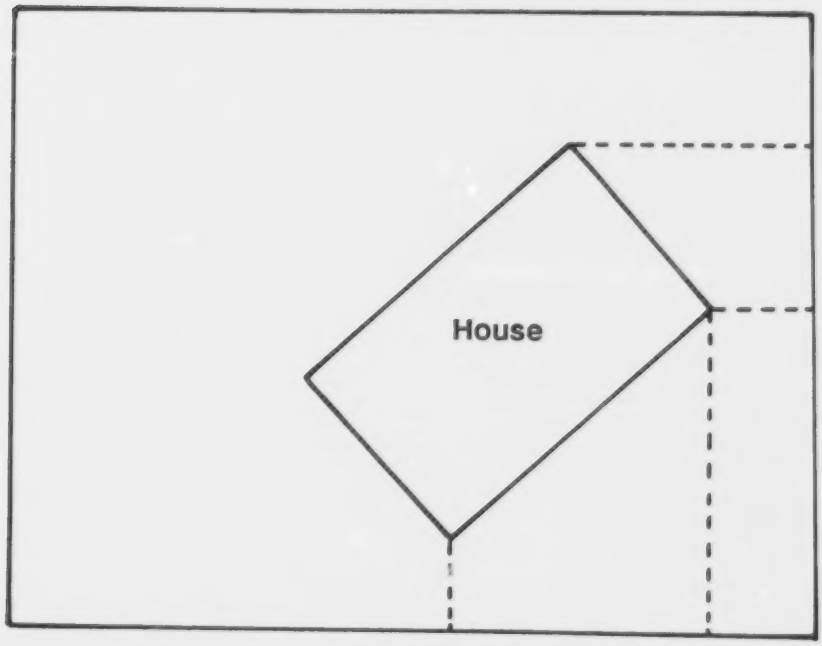
Site Analysis



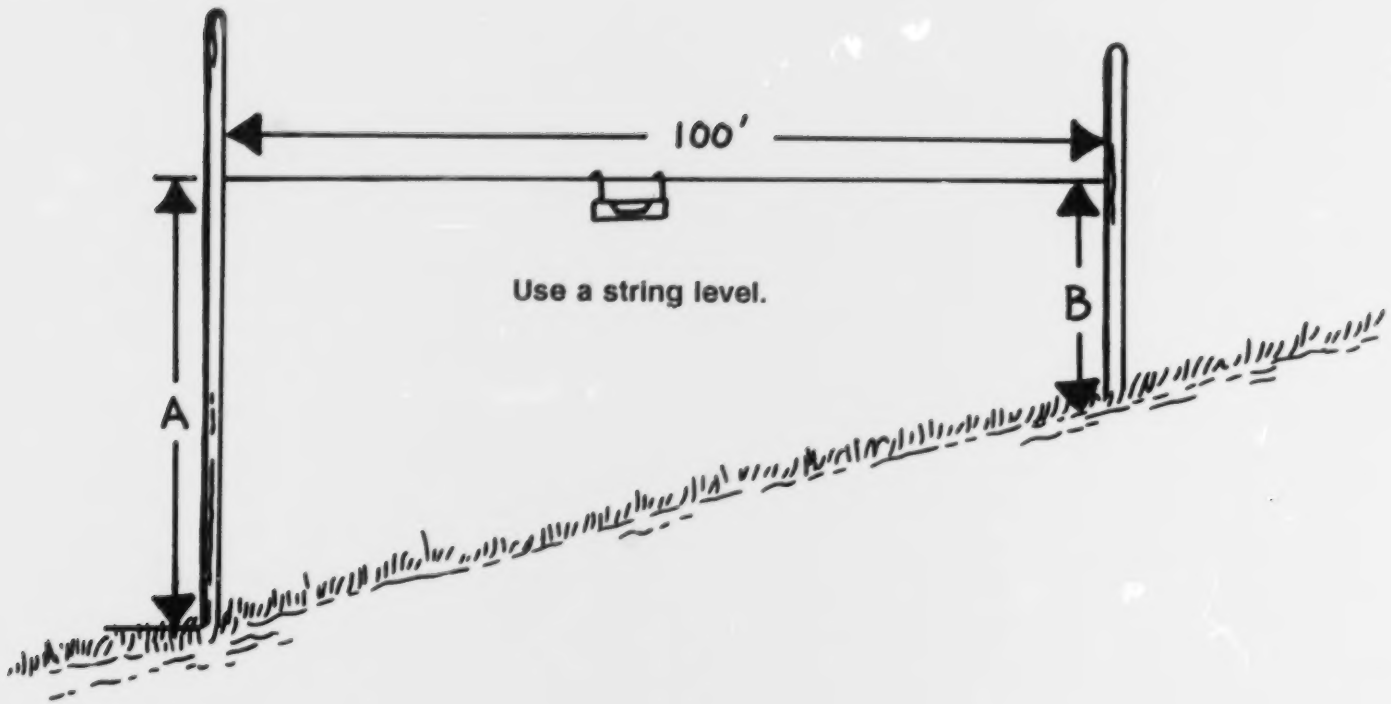
Locating the House and Boundaries

Measure from two points on the house.





Measuring the Grade

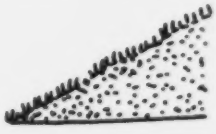
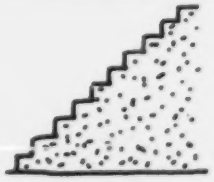


Use a string level.

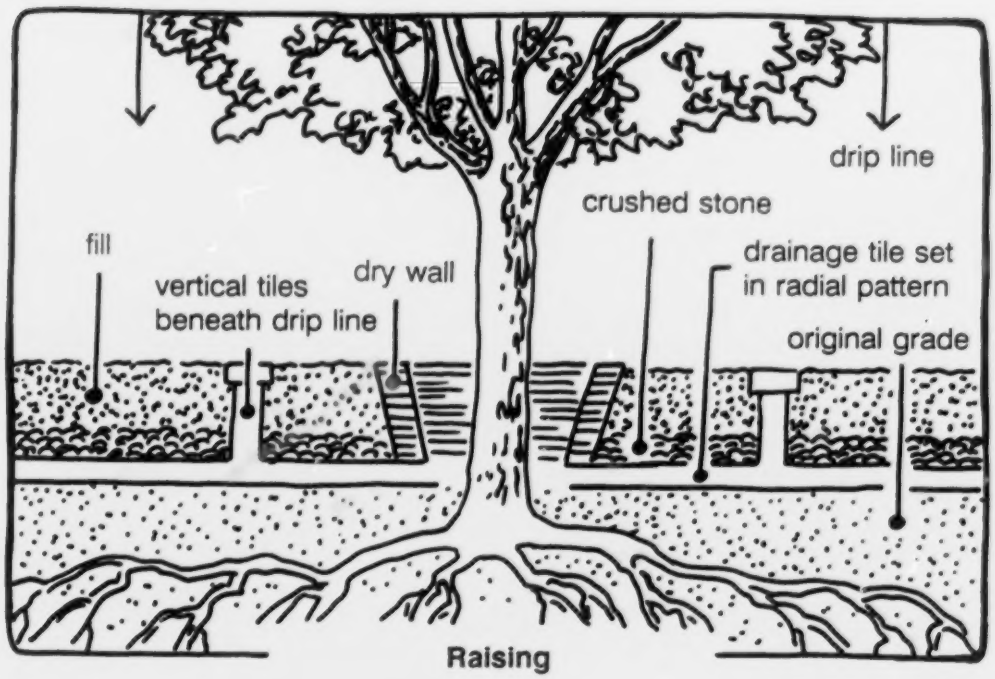
A - B = Slope/100 Feet

A and B should both be in feet increments.

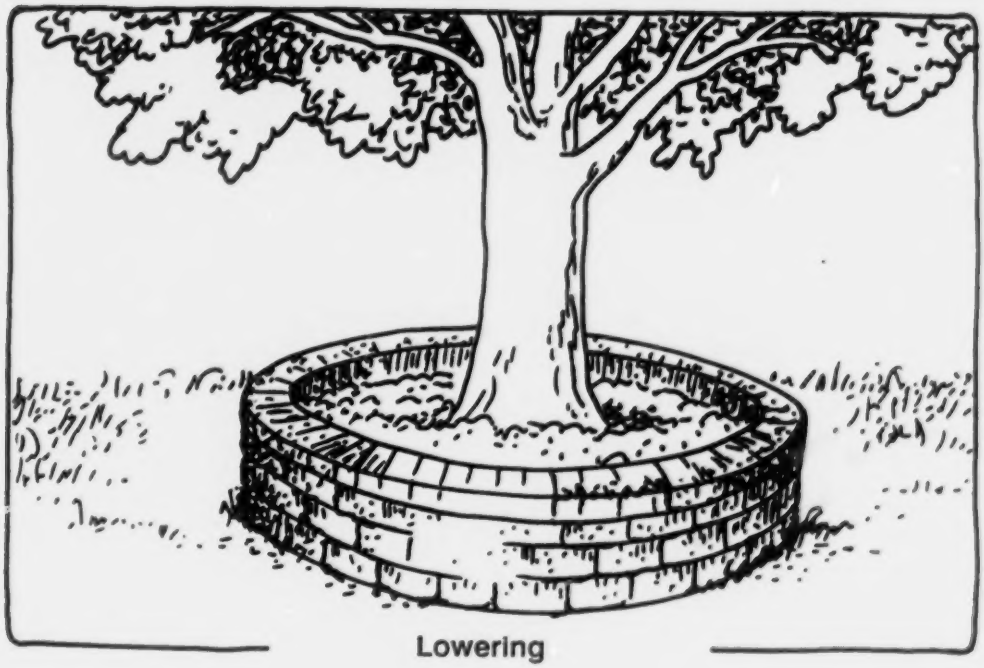
Common Landscape Uses for Slopes

Illustrated Example	Percent of Slope Allowable	Ideal	Landscape Component
	1/2% to 3%	1/2% to 2%	Sitting areas, patios, decks
	1% to 5%	2% to 3%	Lawns
	1% to 8%	1% to 4%	Walks
	1% to 11%	1% to 11%	Driveways and ramps
	Up to 33%	10-20%	Banks planted with grass
	20-50%	20 to 33%	Banks planted with groundcovers and shrubs
	30-65%	33% to 50%	Steps or terracing will be required

Lowering and Raising Grade Around Trees



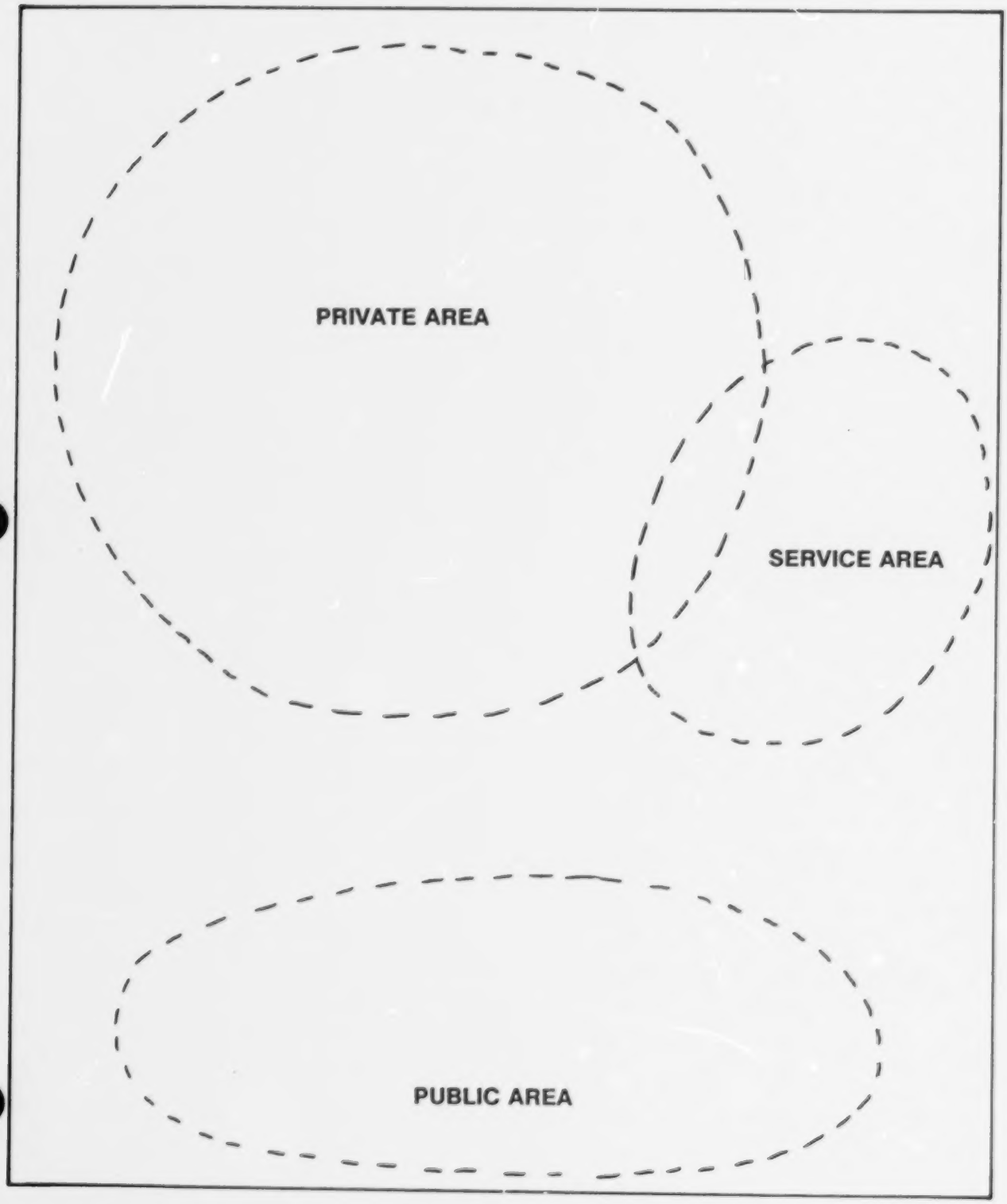
Raising



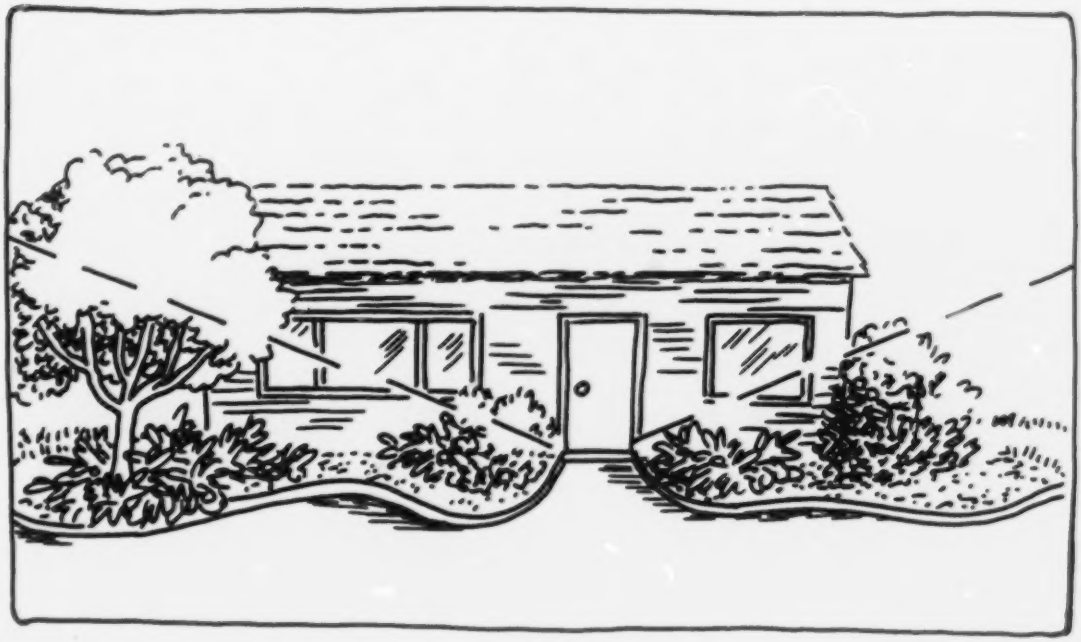
Lowering

22

Use Areas

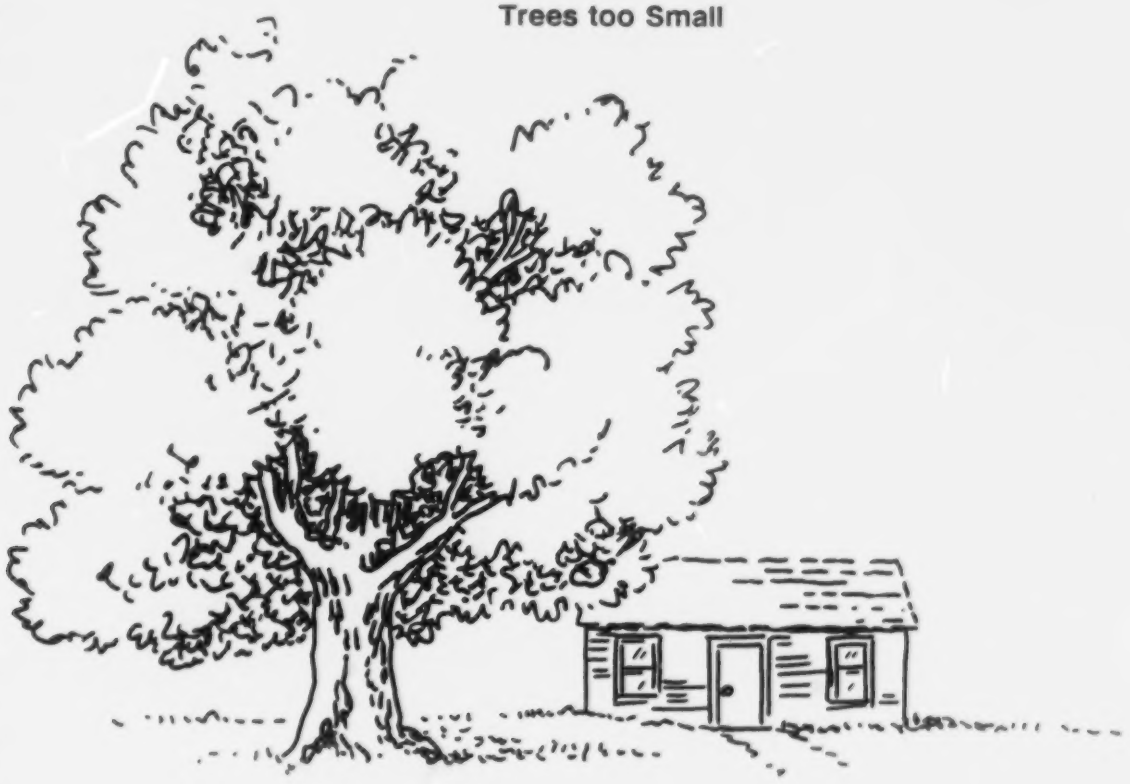


Focal Point



Scale and Proportion

Trees too Small



Tree too Large

Scale and Proportion

Short Cottage

Long Mobile Home

Repetition

Balance

Symmetrical Balance

Asymmetrical Balance

Variety, Sequence, and Contrast

Variety

Sequence

Contrast

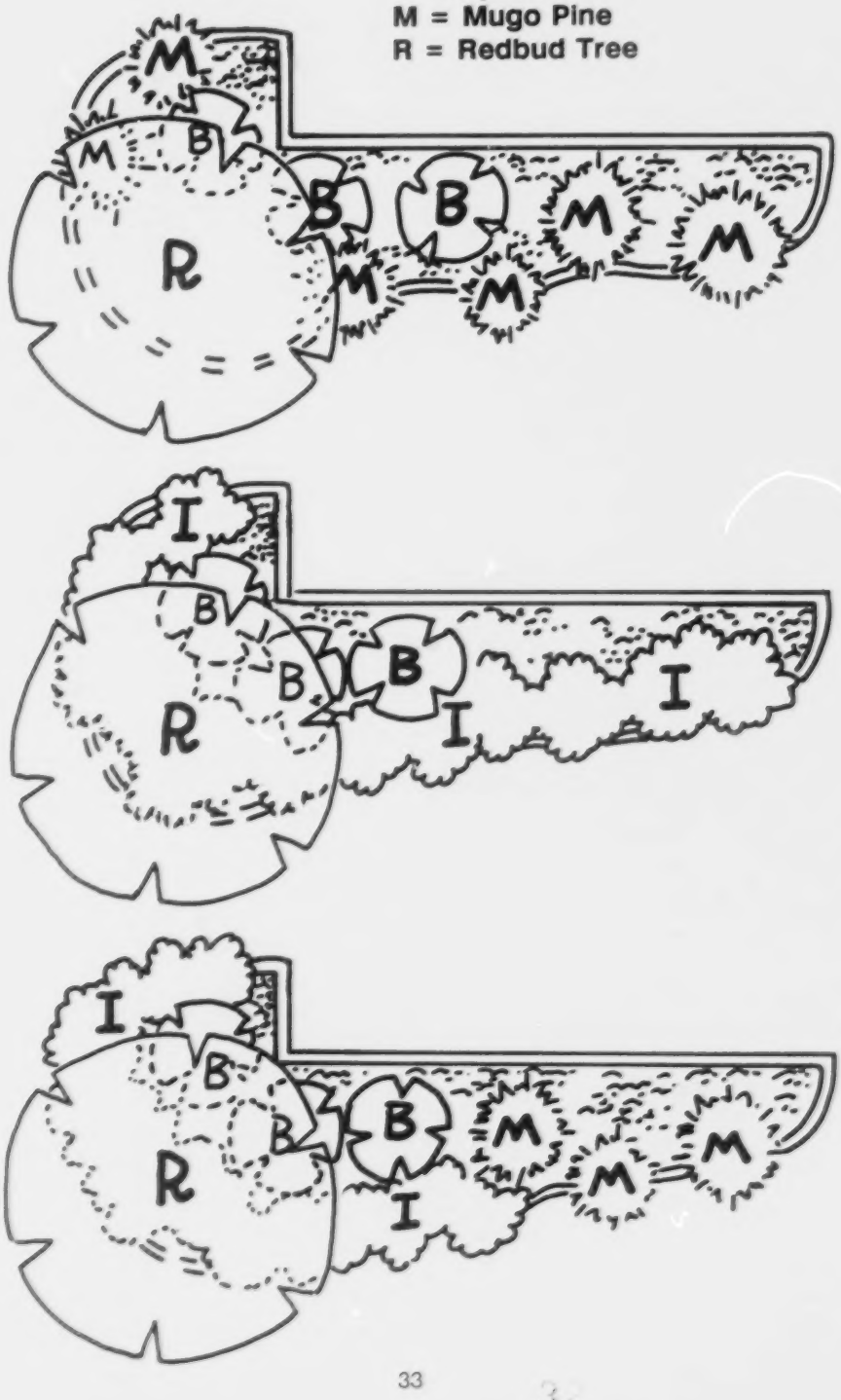
Framing and Background Planting

Framing

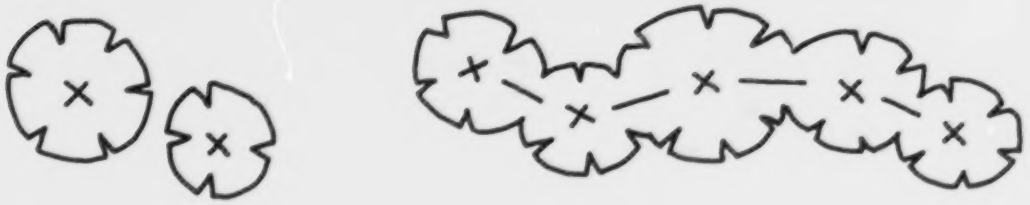
Background Planting

Uses of Flowers in Design

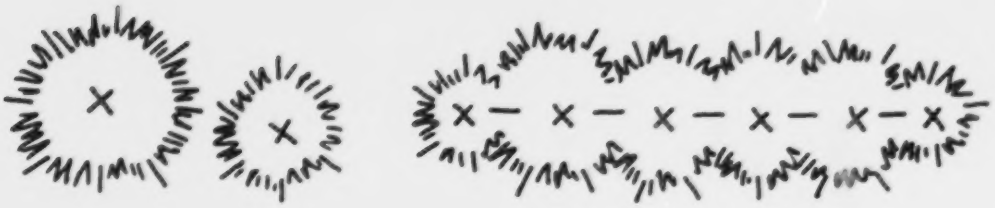
B = Burning Bush
I = Impatiens
M = Mugo Pine
R = Redbud Tree



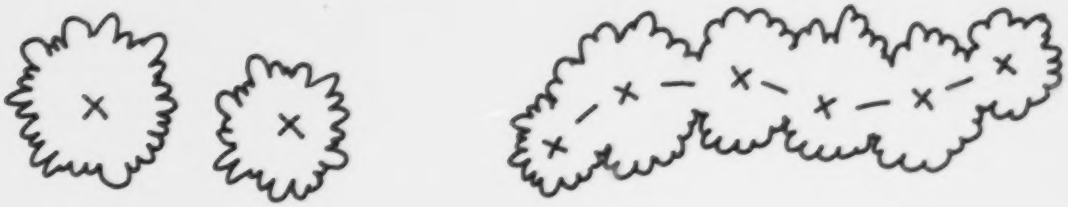
Landscape Design Symbols



Deciduous Trees and Shrubs



Needle-Leaf Evergreens

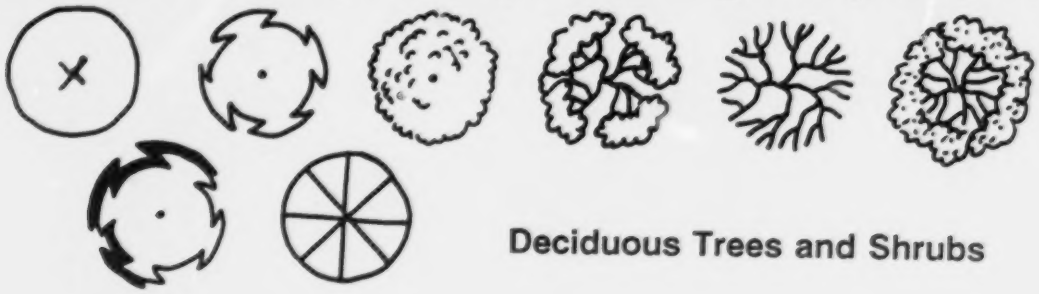


Broad-Leaf Evergreens

Grasses

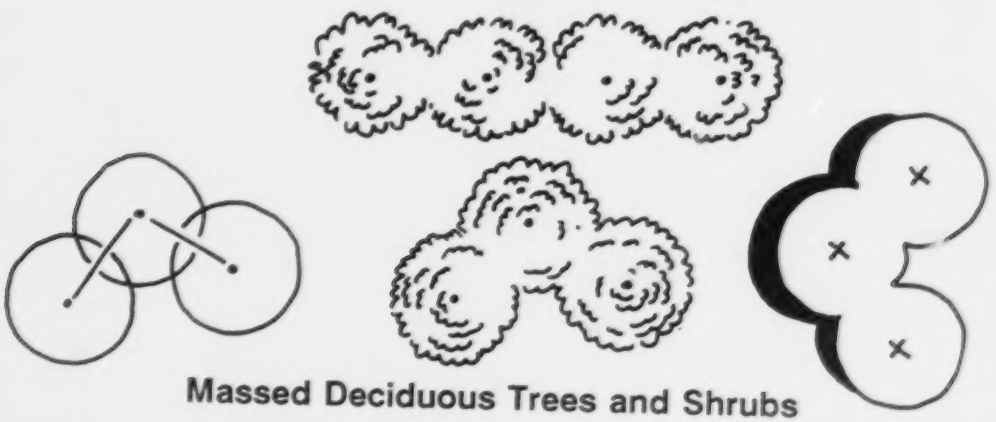
Gravel or Bark

Additional Landscape Design Symbols

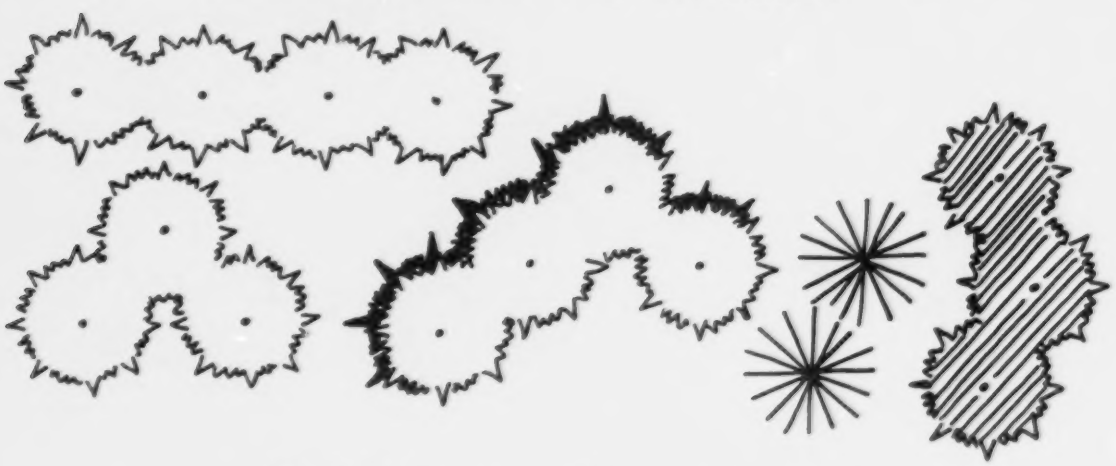


Deciduous Trees and Shrubs

Evergreen Trees and Shrubs

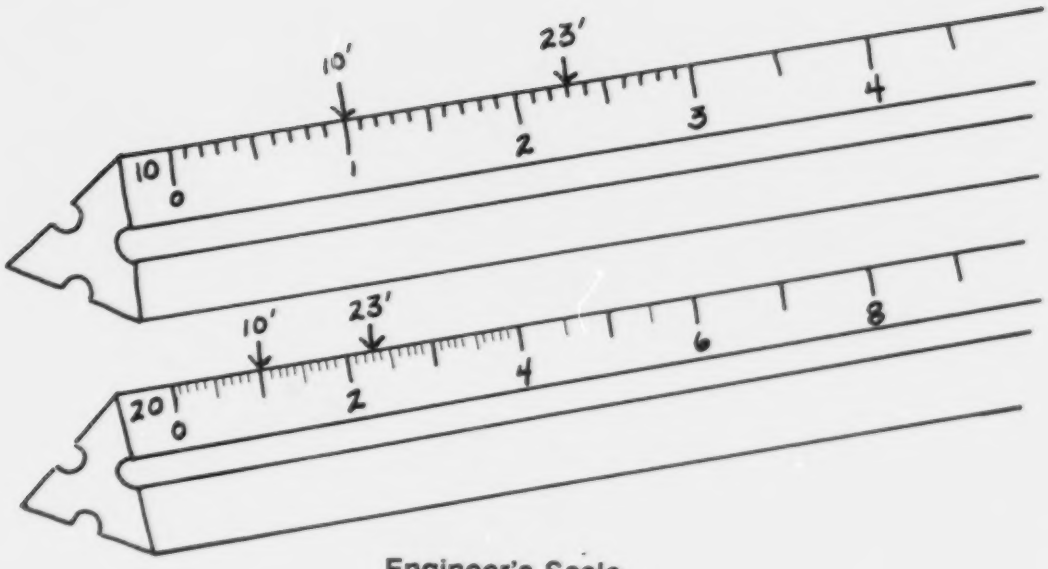


Massed Deciduous Trees and Shrubs

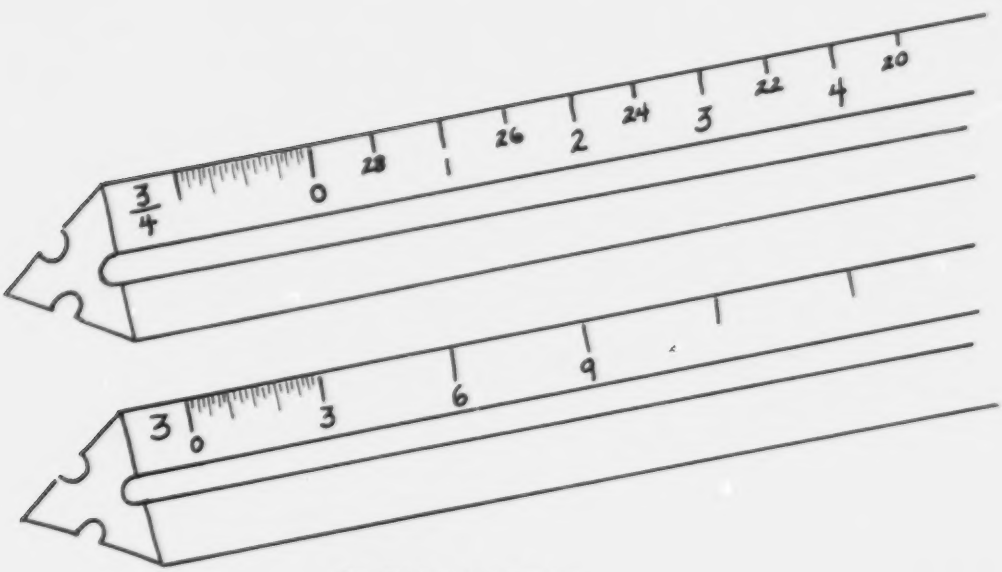


Massed Evergreen Trees and Shrubs

Scales

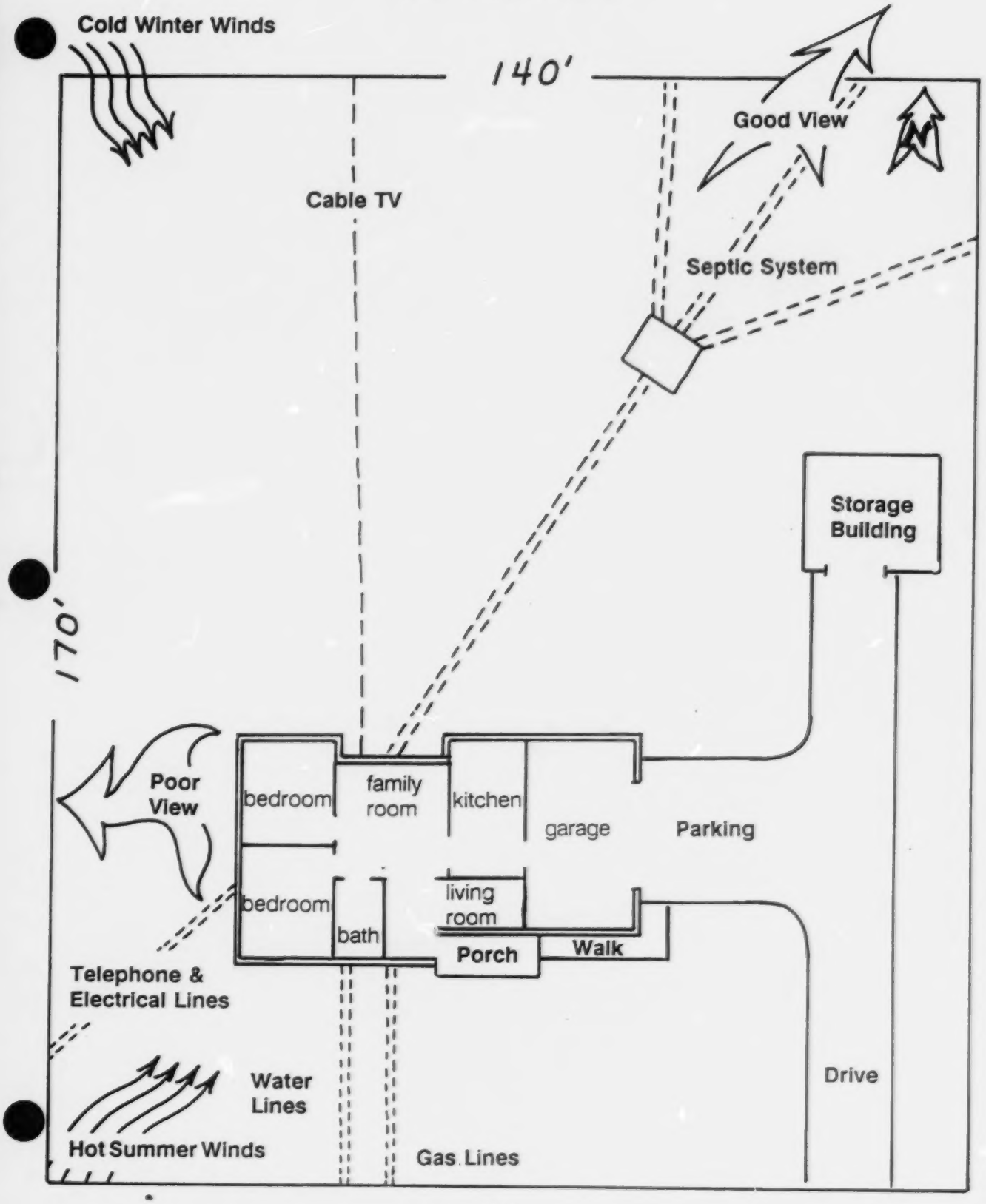


Engineer's Scale

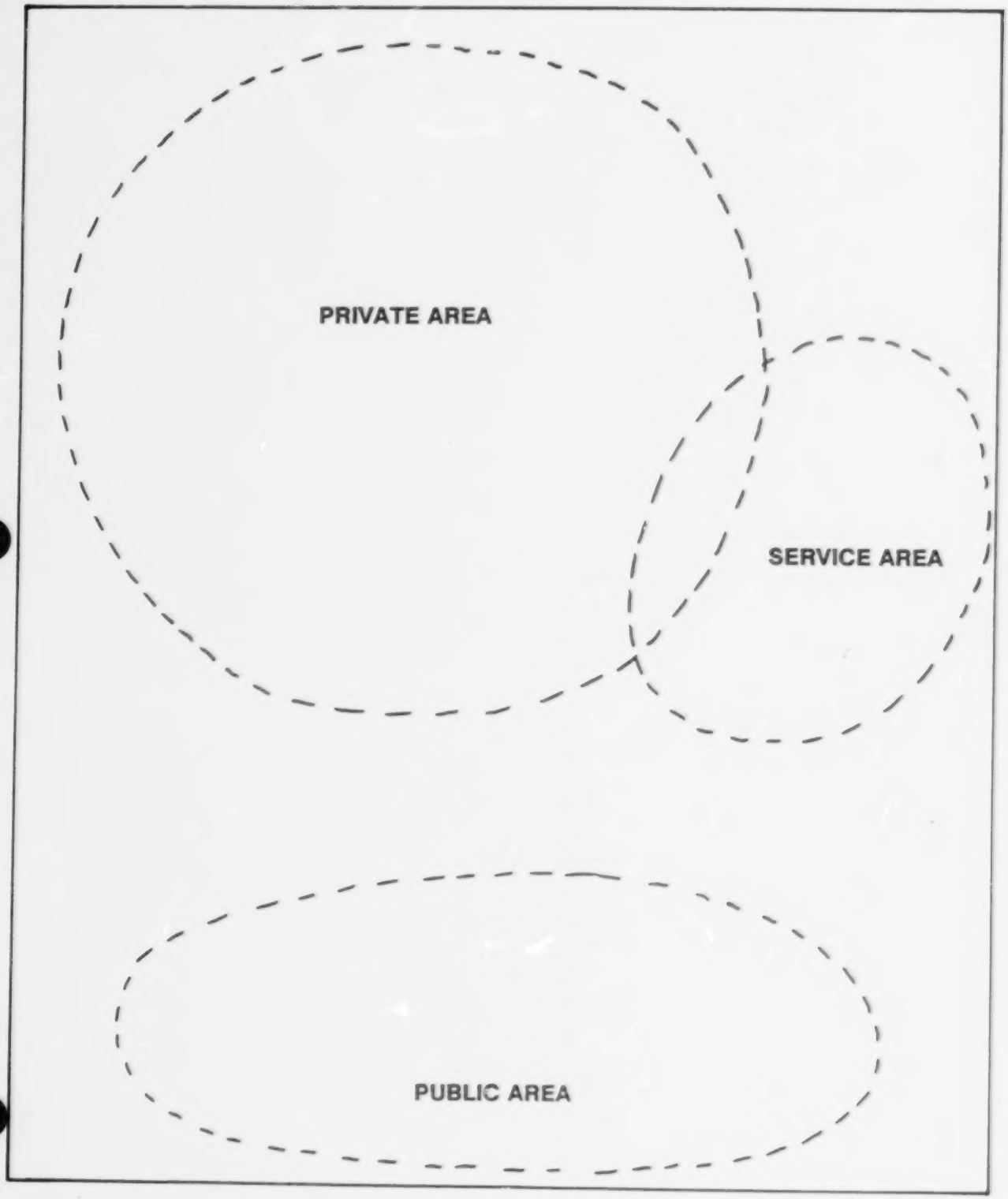


Architect's Scale

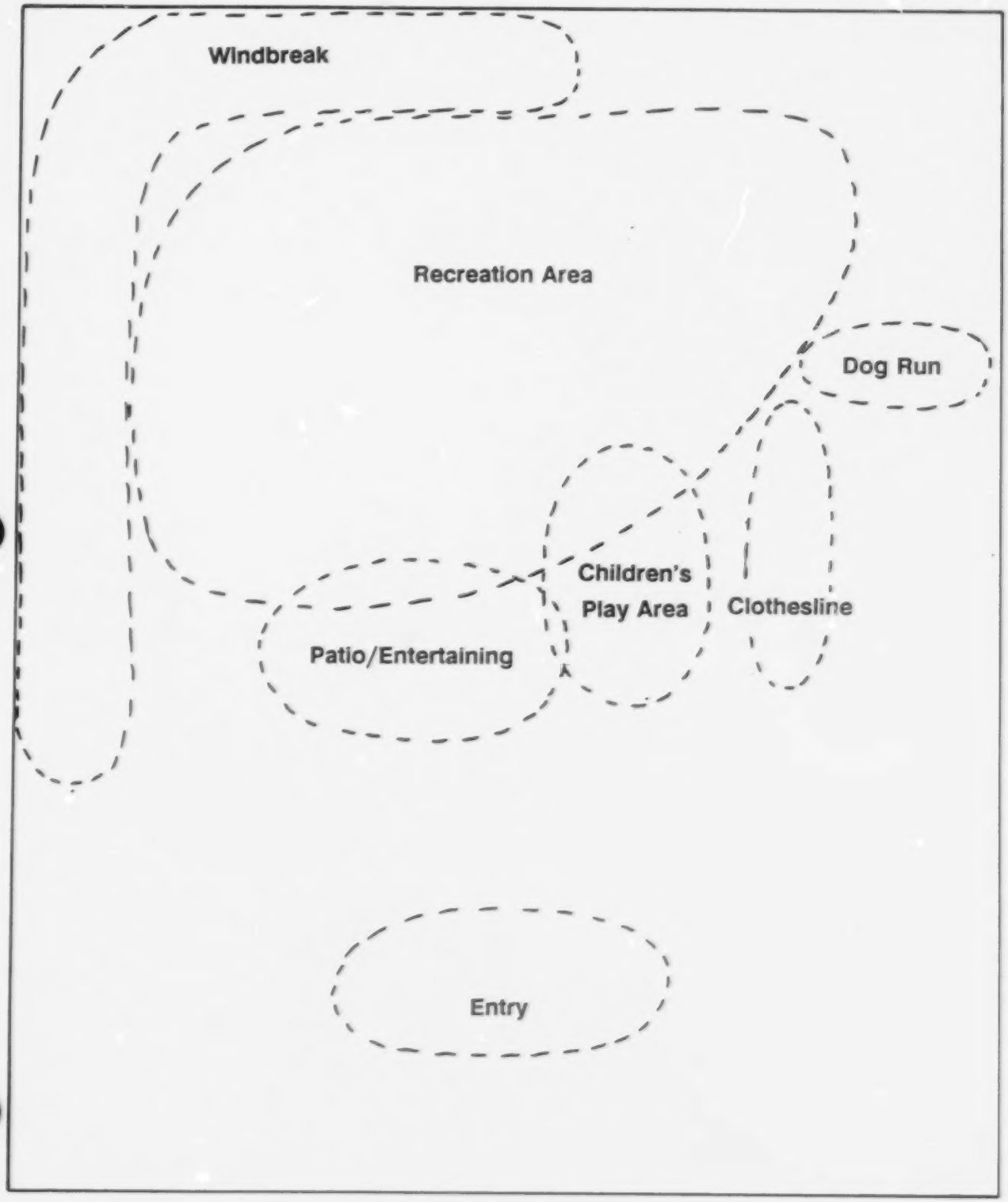
Site Analysis



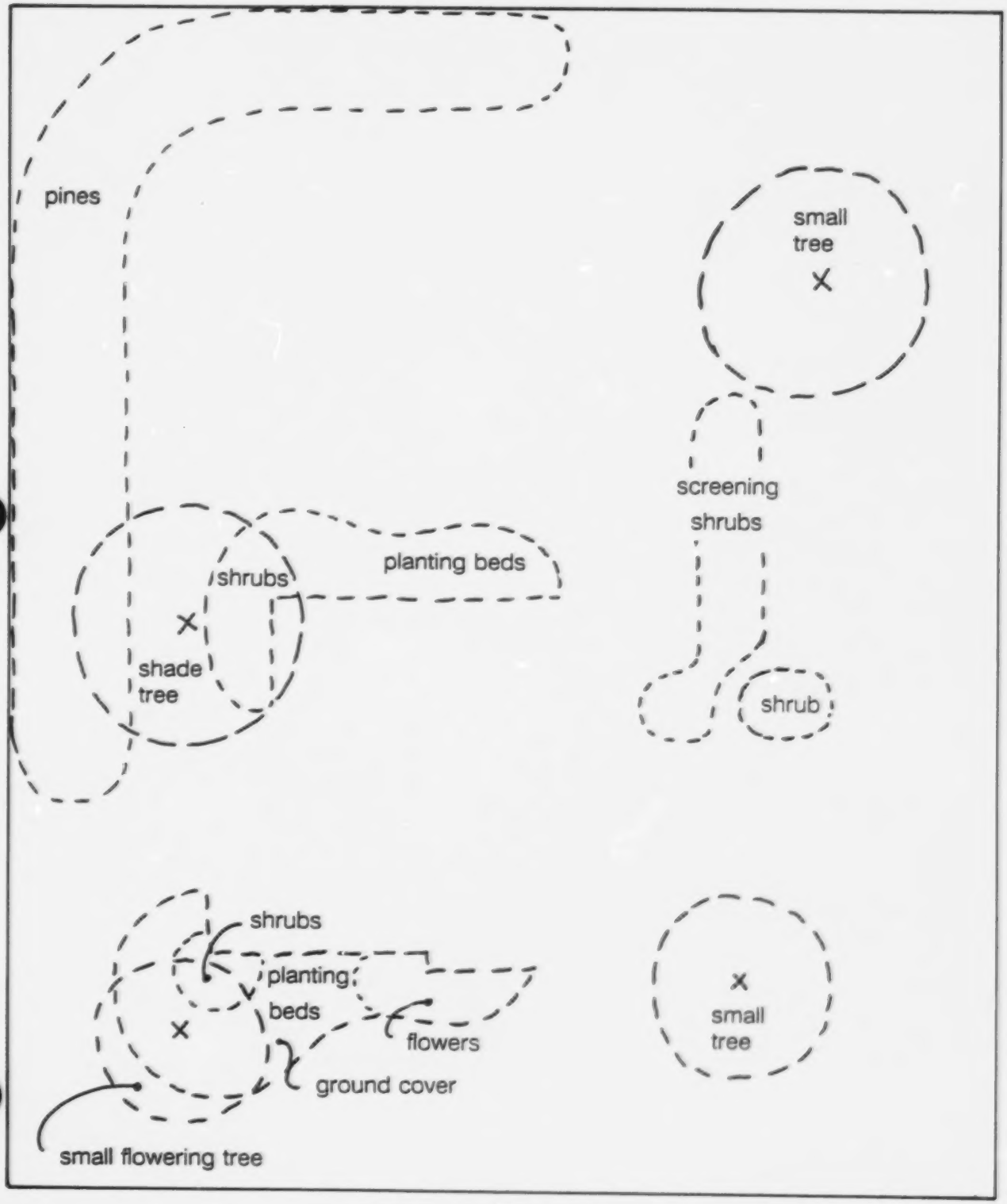
Use Areas



Specific Use Areas



Specific Use Areas and Planting Areas



Lesson 1: Site Analysis and Basic Landscaping Principles

OUTLINE

1. Why should we plan landscapes?
2. Analyzing the site
   a. Manmade features
      1) Shape of lot
      2) Location of permanent features
      3) Location of utilities
   b. Natural features
      1) Physical elements
         (a) Topography and drainage
         (b) Soil
         (c) Present vegetation
         (d) Rock formations
      2) Environmental elements
         (a) Light exposure
         (b) Airflow
   c. Views
      1) On site
      2) Off site
   d. Family-needs assessment
3. Identifying use areas
   a. Public
   b. Private
   c. Service/utility
4. Identifying basic elements of design

a. Focal point

b. Scale/proportion

c. Repetition

d. Balance

e. Variety

f. Sequence

g. Contrast

h. Framing and background

5. Using flowers in the landscape design

6. Making rough sketches

a. Landscape symbols

b. Using a scale

c. Analysis of site

d. Use areas

e. Specific-use areas

f. Specific planting areas

MAJOR OUTDOOR OBJECTIVES

____ Patio/Deck (optimum of 75-100 square feet per family member); small patios and decks are of very little use. Size _____ x _____

____ Swimming Pool Size _____ x _____

____ Shed or Garage Size _____ x _____

____ Additions to the House Size _____ x _____

____ Greenhouse Size _____ x _____

____ Gazebo Size _____ x _____

____ Other Size _____ x _____

OUTDOOR RECREATION

____ Large sports area (volleyball, baseball, football)

____ Small sports area (horseshoes, badminton, croquet, tetherball, archery)

____ Paved sports area (basketball, tennis)

____ Children's play area (sandbox, swings, slide, playhouse)

GARDENS

____ Vegetable garden Size _____ x _____

____ Small fruit (grapes, raspberries, strawberries)

____ Tree fruit (apples, peaches, pears, cherries)

____ Rose garden

____ Flower beds _____ annuals _____ perennials

SERVICE AREA

____ Clothesline

____ Firewood storage

____ Dog run

____ Trash burner

____ Compost pile

____ Car, boat, camper storage

PLANT CHOICES

Specific plants to include _____

_____

_____

Specific plants to exclude _____

_____

Colors of flowers you like _____

Colors of flowers you dislike _____

____ Plants to attract birds and wildlife

____ Plants to provide shade

____ Plants to screen (Formal hedges are high maintenance plants.)

Views to hide or emphasize _____

Time available for landscape maintenance _____ hours/per week

Other features to consider _____

_____

_____

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 2: Plants and Hardscapes

A. Review

1. Why do we landscape our lawns?
2. What site elements are important to consider when landscaping?
3. What are the basic elements of design?
4.
5.

B. Objectives

The student will be able to:

1. Explain qualities of plants that make them desirable for use in the landscape.
2. List five trees and shrubs that attract birds and wildlife.
3. List four ways to minimize maintenance in the landscape.
4. Explain how windbreaks and shade trees help conserve energy.
5. Explain how to purchase plants.
6. List five hardscape materials used in landscape design.

C. Motivation

1. Bring in several hardscape samples, such as edgings, mulches, and weed barriers, and ask the students how the hardscapes could be used in their landscapes.
2. Bring in samples of balled and burlapped, container-grown, and bareroot trees and discuss the quality of the plants.

D. Key Points

1. Plant variety lists
2. special landscaping situations
3. Obtaining plants
4. Wall and bed construction materials
5. Weed barriers
6. Mulches
7. Edging materials
8. Walkway and patio materials

E. Introduction of Information (**Distribute HO 2.1, outline.**)

1. **Plant variety tables** (**Distribute** <u>Identifying and Selecting Plants for the Landscape</u>.)

   a. The plant selection tables provide information on a selection of common landscape plants. This selection is not meant to be a complete list of possible landscape plants. Use gardening books and professional advice in making plant selections.
   b. Evergreen plants keep their leaves all year. Deciduous plants loose their leaves in the fall.
   c. Plant characteristics
      1) Common name - This is the most frequently used name of the plant.
      2) Botanical name - Botanical names are latin names giving standardization to the

naming process. Using the botanical name of a desired plant can clarify differences in common names at nurseries.

3) Height - The height given is the average, mature height of the plant. The height needs to be considered when placing a plant around homes and power lines. Do not plan on pruning to maintain the desired height. Select plant varieties and cultivars to fit the location. **(TM 2.1)**
4) Width - The average plant width, or spread, will be useful in placement and spacing.
5) Shape - Shape refers to the growth habit of the plant. **(TM 2.2)**
6) Growth rate - The growth rate is influenced by factors such as fertilization and light requirements.
7) Hardiness zone - Northern Missouri is zone 4. Central Missouri is zone 5 and southern Missouri is zone 6. The hardiness zone generally refers to the plant's ability to withstand cold temperatures.
8) Use in landscape - This category gives suggestions for use.
9) Color (leaf) - It is important to consider spring, summer, and fall leaf colors when selecting plants.
10) Flowering color - When selecting plants, not only consider the color of the flower but also consider when it flowers.
11) Fruiting - Many landscape plants have persistent fruit that have ornamental value. Persistent fruit stays on the plant for a reasonable length of time. On some plants, the fruit persists throughout winter.
12) Texture - Texture refers to size of leaf and branching coarseness.
13) Soils - The soils category gives general soil types in which the plant grows best.
14) Water - This category gives optimum water levels.
15) Light - The light category identifies if the plant requires full sun, partial sun, or shade to grow best. Plants requiring full sun would do the best in the open or on the south or west side of the house. Plants requiring shade should be planted under trees or on the north side of the house.
16) Disease and insect problems - Some plants tend to be bothered by specific diseases and insects; check this column for specific problems.
17) Pruning - Some plants need to be pruned at the proper time as to not disrupt blooming.

2. **Special landscaping situations**

a. Plants to attract wildlife and birds
   1) Many trees and shrubs attract birds and wildlife for food and cover. Windbreaks and shelterbelts are excellent wildlife areas. You may desire to include a specific area to attract birds and wildlife or use these attractive plants throughout the landscape.
   2) **Handout 2.2** provides examples of plants that attract wildlife. Other references may be used to identify specific animals and birds. Consider in your selection of plants whether the plants have landscape qualities. Landscape qualities include shape of the plant, ornamental flowers or fruit, and plant health.

b. Landscaping for minimum maintenance - The landscape design can help to reduce labor. The construction materials used, plant placement, plant selection and the design itself can reduce maintenance.
   1) Use gentle curves in the design. Tight concave curves or inside right angles create mowing problems. **(TM 2.3)**
   2) Use quality edging around planting beds to neatly control the lawn. Use a high quality plastic edging or a commercial steel edging. Inexpensive edgings will quickly look frayed and will not make a quality barrier. Rock and brick borders frequently create weeding problems.

3) Use a combination of landscape fabric, mulch, and pre-emergence herbicides to control weeds in landscape beds. Wood/bark mulch makes an effective and attractive barrier. It should be two inches thick.

4) Plant placement is an important consideration. Place shrubs and flowers in borders to reduce maintenance.

5) Plant selection is very important. Find the best plant for your needs. Use the plant tables and determine the mature height and spread of the plant. Dwarf cultivars of many varieties are available. Use plants that are hardy for your area and that are resistant to diseases and insects. Do not use high-maintenance plant materials or techniques, such as shearing plants and hedges. **Handouts 2.3 and 2.4** list low- and high-maintenance plants.

c. Landscaping to conserve energy

1) Windbreaks **(TM 2.4)**

(a) Windbreaks can reduce winter fuel bills by as much as 25 percent.

(b) Windbreaks are planted on a ninety-degree angle 40-50 ft. from the north west corner of the house. Evergreens such as pines and cedars make the best wind barriers.

(c) Windbreaks can also be used to reduce noise and smells.

2) Deciduous trees can lower cooling bills in summer by shading the home from the sun. West and south placement are most effective. **(TM 2.5)**

3. **Obtaining plants**

a. General guidelines

1) Buying plants

(a) When buying plants, buy quality plants from a reputable source. If you buy plants from lumber yards, hardware stores, or discount stores, buy them early in the season soon after they are delivered.

(b) It is best to purchase and plant trees and shrubs in the fall or early spring.

(c) Look for plants with good branching habits and ones that are full in shape.

(d) Some plants can be purchased in catalogs. Don't expect an $8.00 tree in the catalog to look like a $40.00 tree at a nursery. If money is tight and time is not a problem, these trees and shrubs may nicely fit your needs.

2) Digging trees from the wild - If you attempt to transplant trees, do it when the plant is dormant and attempt to keep soil around the root ball.

b. Forms to purchase plants

1) Balled and burlapped (B & B) plants

(a) B & B plants will have an intact soil ball making them the most successful in transplanting.

(b) B & B are also the best quality plants and the most expensive.

2) Container-grown plants

(a) These plants have grown in a container (pot) for at least six months.

(b) They transplant well and are of good quality.

3) Bareroot plants

(a) Bareroot plants have had all of the soil shaken off the roots.

(b) They have been stored in cool rooms with their roots kept moist at all times.

(c) Not all plants will transplant this way.

(d) These plants are the least expensive and will require more time to produce a quality plant.

4) Ground covers, perennials, and annuals are usually sold in packs or small containers.

4. **Wall and bed construction materials**

Regardless of the type of material used, the base layer should be level.

a. Railroad ties and landscape timbers
   1) Both of these materials are available for the homeowner and fairly easy to use.
   2) Walls should not be built over four feet tall and should have deadmen to reduce the chance of falling over. **(TM 2.6)**
   3) Rebar rods can be driven into predrilled holes to help hold railroad ties together. Six-inch spikes can be used to hold landscape timbers together.
   4) Walls should lean slightly into the soil.

b. Stone
   1) Stone can be used loose or with cement. Loose stonework should not be expected to hold back much soil.
   2) Build stone walls with a wide base for support. **(TM 2.6)**
   3) Loose stone walls may require upkeep. Smaller stones require more upkeep. As stone size decreases, maintenance requirements increase.

c. Brick and concrete - Both materials can make attractive walls, but may require professional help.

5. **Weed Barriers**

a. Landscape fabric
   1) Landscape fabric can be purchased in small or large rolls, with widths from four to eight feet.
   2) Landscape fabric, which resembles light felt material, allows water and air to pass through, but stops most weeds.
   3) Nutsedge is generally not stopped by the landscape fabric and will require a pre-emergence herbicide.

b. Black plastic
   1) Plastic is less expensive than landscape fabric, but it does not allow air and water to pass through. This can cause souring of the soil.
   2) If no plants are located in the area, it will work fine.

6. **Mulches**

Mulches reduce weeds, hold moisture, and keep soil temperatures more consistent, but must be at least two inches deep to be effective.

a. Gravel
   1) Ornamental gravels or stone can give a lasting quality to your landscape.
   2) White rock tends to become dirty with age and lose its appeal.

b. Bark chips and bark mulch
   1) Bark chips and mulch make excellent mulches. They are attractive, inhibit weed growth, and hold in moisture.
   2) Bark chips or nuggets are of higher ornamental quality than bark mulch.
   3) Be careful when using bark mulch from city piles as it may contain diseases and insects.
   4) Bark mulch will need to be replenished occasionally, because it discolors and can be blown away.

c. Other mulches
   1) Other materials (e.g., straw and wood chips) can also be used, but they usually do not add to the landscape quality.

7. **Edgings**

Edgings keep mulch in landscape beds and keep grass in the lawn. Edgings make a good visual barrier between the two.

a. Plastic
   1) Plastic edging is the most commonly used, because it is easy to handle, flexible, and reasonably inexpensive.
   2) Use high quality black plastic edging, which is rigid, but can make gentle curves.
   3) Black plastic edging is partially buried and held down with stakes. It is just above the soil level so it can be easily mowed over.

b. Railroad ties and landscape timbers - Both materials give nice and neat edges but frequently require weed trimming.

c. Steel edging
   1) Steel edging is a high quality commercial type edging. It gives a neat and clean appearance.
   2) Steel edging is frequently hard to locate.

d. Concrete
   1) Concrete can be used as an attractive edging if properly poured.
   2) Commercial companies have machines to pour and shape the concrete in one motion.

e. Brick and stone
   1) Bricks and stones are easy to acquire but will tend to add time to maintenance, unless they are set in concrete.
   2) They will need to be hand- or power-weeded and will require resetting frequently.

f. Natural edging - This refers to cutting a small depression around the beds, which allows the soil to be the barrier.

8. **Walkway and patio materials (TM 2.7)**

Walkways and patios should start with a four- to six-inch hole. At the bottom, place a piece of black plastic to keep weeds out. Next, place two to four inches of gravel or sand. Brick and flagstone should be in sand unless they are put in concrete.

a. Brick - Brick can be placed in a concrete base or in sand. Concrete is more permanent, but sand allows for changes in design.

b. Flagstone
   1) Flagstone is a flat, thin stone. It requires more work in fitting pieces together and cutting the stone, but success can be achieved with practice.
   2) Flagstone can provide a more informal yet attractive patio or walk.

c. Concrete
   1) Concrete is basically a smooth surface. It provides better footing than other walkway materials.
   2) Concrete is fairly inexpensive compared to other walkway materials for the permanent quality provided.
   3) Concrete should be four inches deep for patios and walks.
   4) Concrete can be plain, dyed, or have gravel imbedded on the top for special effects.

d. Stepping stones
   1) Stepping stones make good informal paths.
   2) Many types, styles, and sizes are available.

F. Group Discussion

G. Summary and Conclusions

1. What plant qualities are desirable in landscapes?
2. What things can be done to minimize landscape maintenance?
3. How can plants help conserve energy?
4. Where can plants be purchased and in what forms?
5. What hardscape materials are better for the home landscape?
6.
7.

H. Announcements and Social

I. Materials

1. Instructor

   a. Transparency Masters (TMs 2.1-2.7)
   b. Samples of hardscapes
   c. Samples of forms (i.e., B & B, bareroot, and container) to purchase plants

2. Student

   a. Handouts (HOs 2.1-2.4)
   b. Identifying and Selecting Plants for the Landscape. University of Missouri-Columbia: Instructional Materials Laboratory, 1990.

3. Supplementary Resources

   a. Dirr, Michael A. Manual of Woody Landscape Plants. 3rd ed. Champaign, IL: Stipes Publishing Co., 1977.

   b. Ferguson, Barbara, ed. All About Trees. San Francisco, CA: Ortho Books (Chevron Chemical Co.), 1982.

   c. Martin, Edward. Landscape Plants in Design. Westport, CT: AVI Publishing Co., Inc., 1983.

   d. Rocca, James P.; Dale Starkey; Eldon Heflin. Trees for Urban Missouri. Jefferson City, MO: Missouri Department of Conservation, 1987.

   e. Suchland, Arthur R.; Larry B. Behrens; P.S. Jefferies. Conservation Trees and Shrubs for Missouri. Jefferson City, MO: Missouri Department of Conservation, 1983.

   f. Whitcomb, Carl E. Know It and Grow It II. 2nd ed. Stillwater, OK: Lacebark Publishing, 1985.

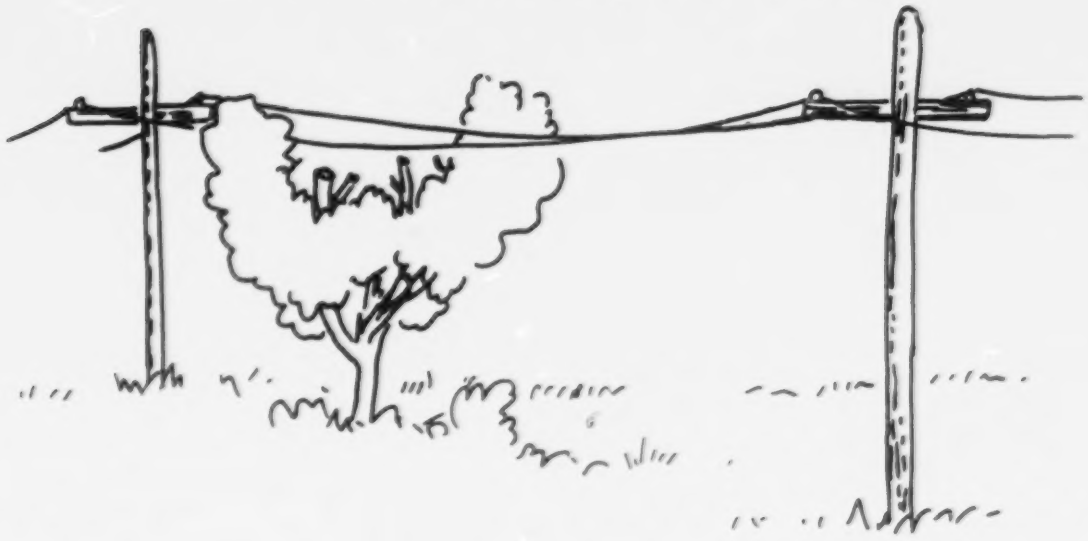
   g. Wirth, Thomas. The Victory Garden Landscape Guide. n.c.: Little, Brown, and Company, 1984.

4. Supplementary Activities

   a. Show slides of plant characteristics.
   b. Go to a nursery to see plants and hardscapes.

Plant Placement/Selection

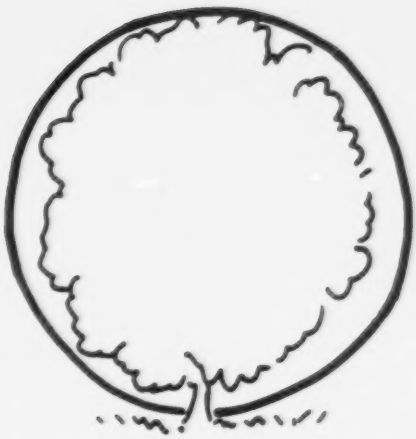
TM 2.1



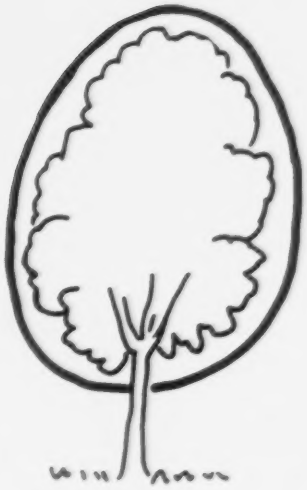
Poor Plant Selection

Poor Placement or Selection

Form

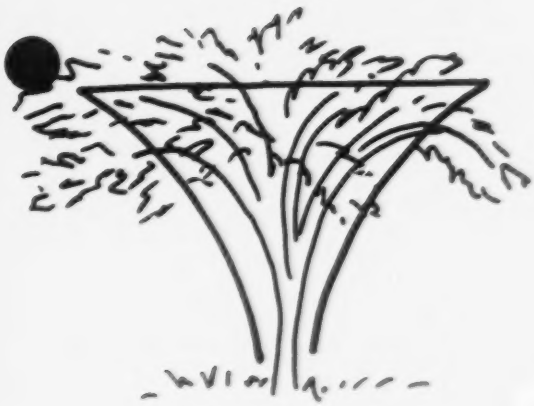


Round

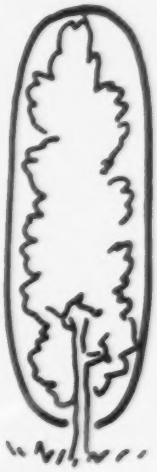


Oval

Pyramidal

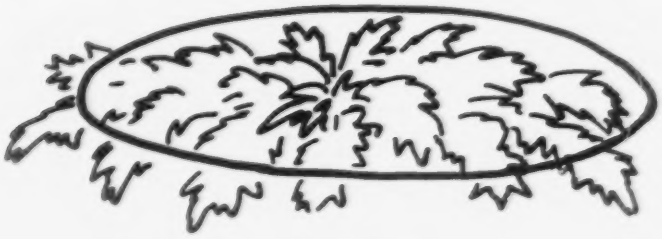


Vase



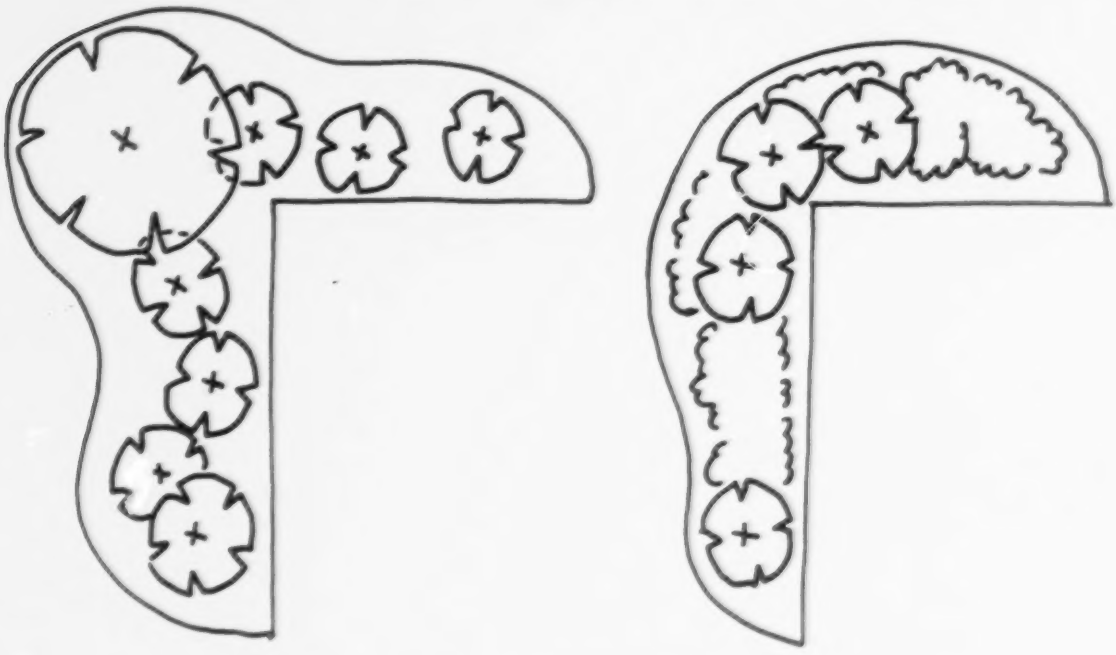
Columnar

Irregular

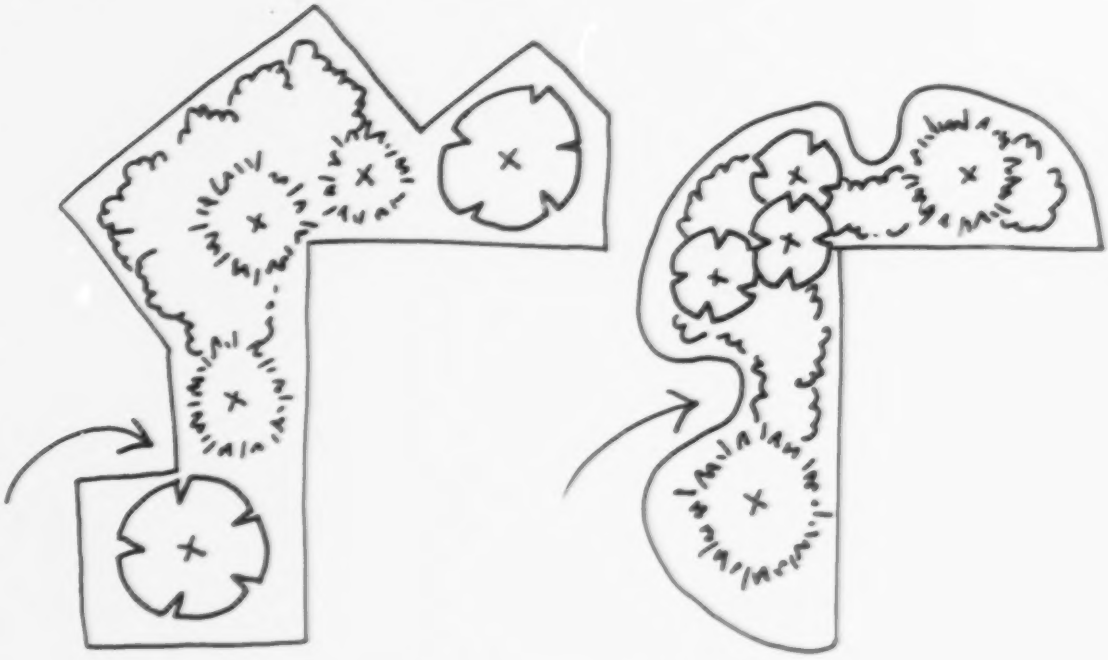


Spreading

Use Gentle Curves in the Design



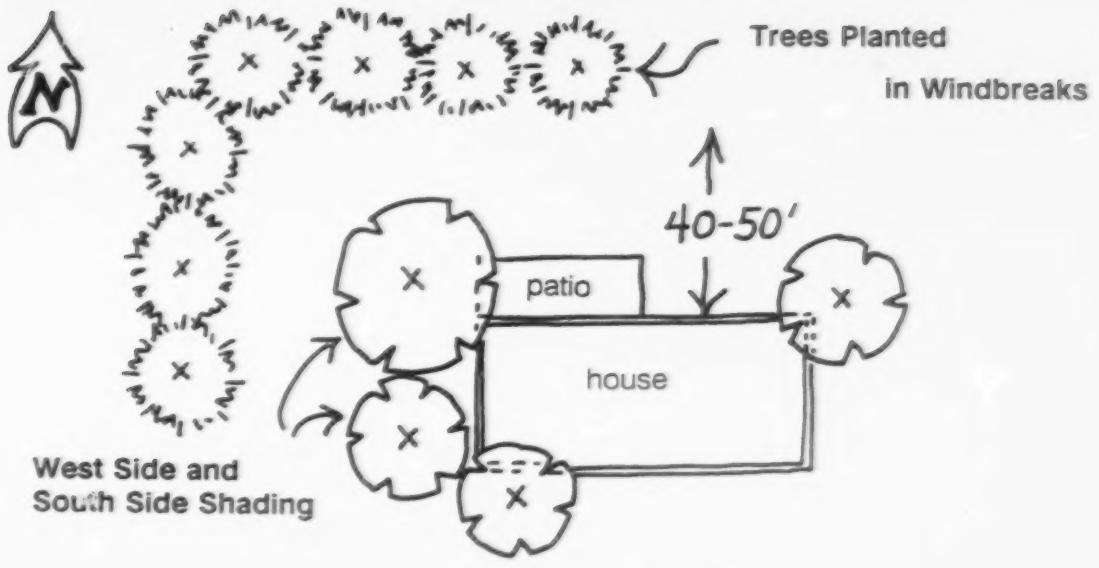
Gentle curves are easier to mow around.

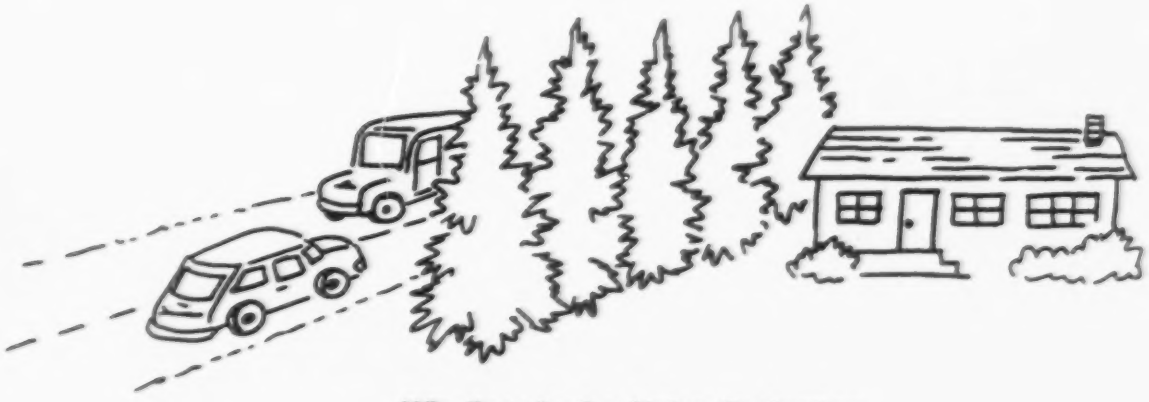


Tight places require weed trimming.

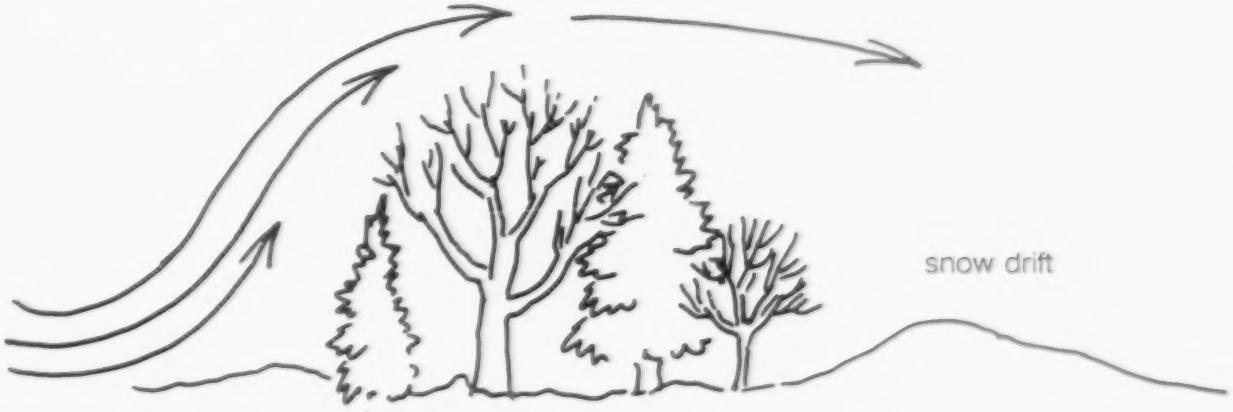
Windbreaks

TM 2.4





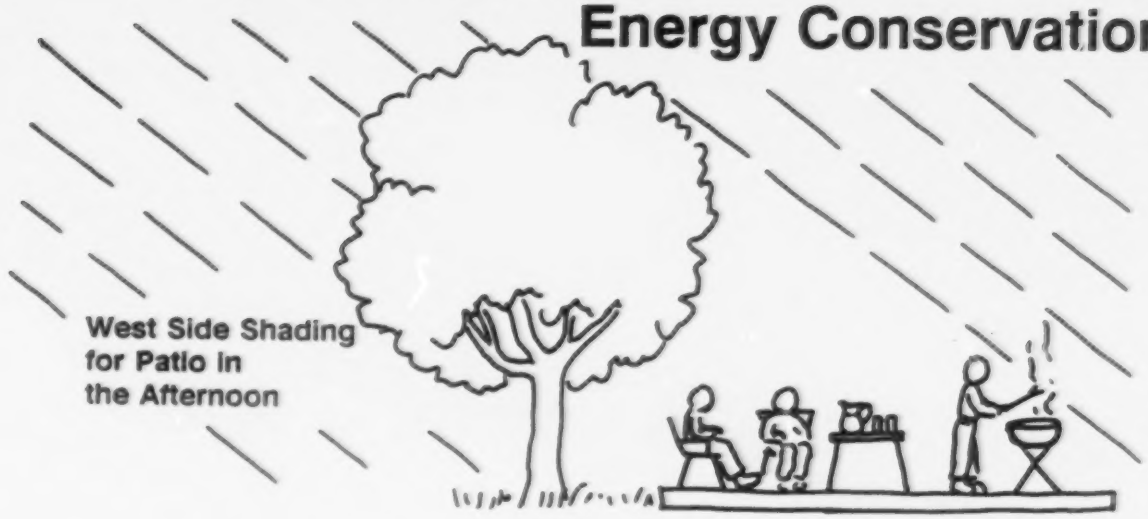
Windbreaks for Noise Reduction



Windbreak for Wildlife and Winter
Wind/Snow Protection

Tree Placement for Energy Conservation

TM 2.5



West Side Shading for Patio in the Afternoon

Tree Placement for Shade in Summer and Sun in Winter

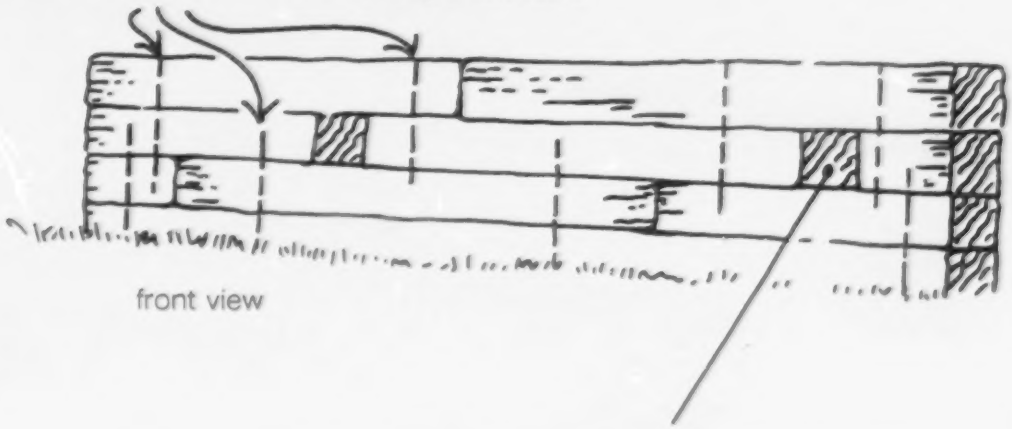
Summer

Winter

Wall Construction

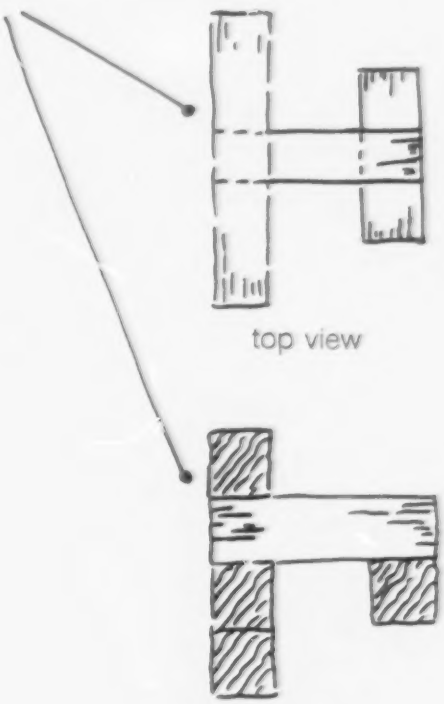
Railroad Ties and Landscape Timbers

Use rebar rods or stakes to connect ties.
Spikes can be used with landscape timbers.



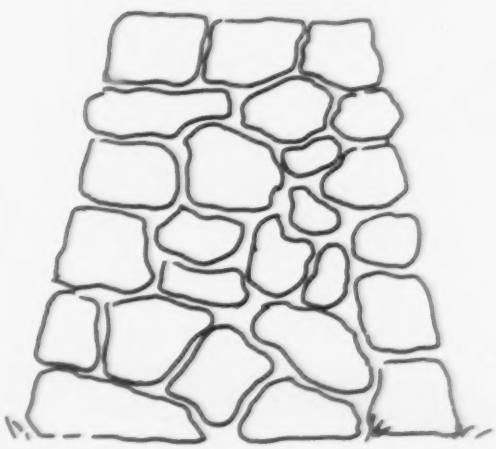
front view

Use deadmen to prevent the soil from pushing the wall over.



top view

side view

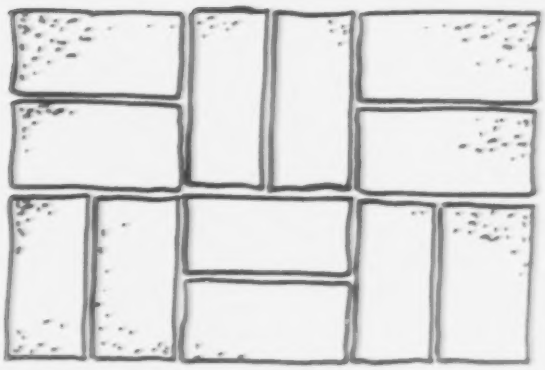


Stone Walls

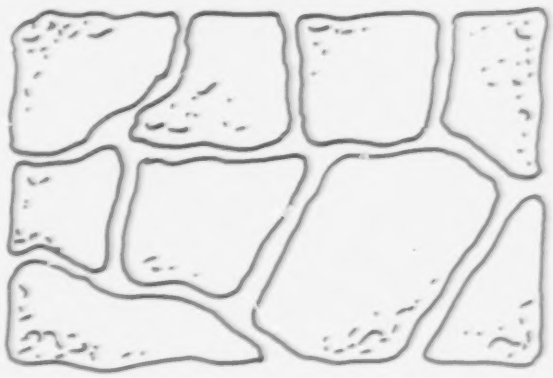
Use a wide base for support.

Walkway and Patio Materials

TM 2.7

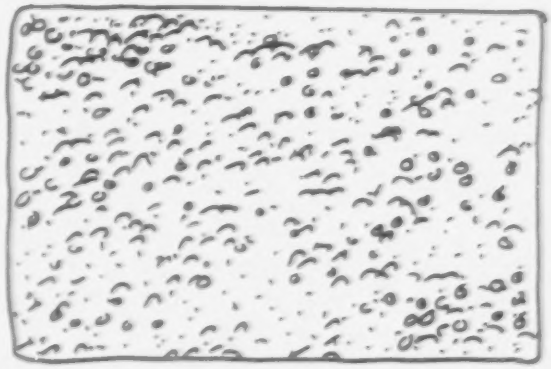


Brick



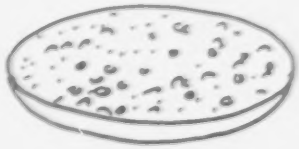
Flagstone

Concrete

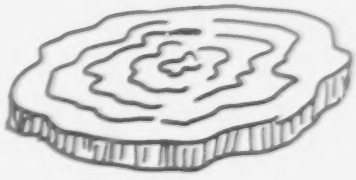


Concrete with Pebble Surface

concrete



concrete with pebble surface



wood-look concrete

square

Stepping Stones

Lesson 2: Plants and Hardscapes

OUTLINE

1. Plant variety tables
2. Special landscaping situations
   a. Attracting birds and wildlife
   b. Landscaping for minimum maintenance
   c. Landscaping to conserve energy
3. Obtaining plants
   a. General guidelines
   b. Forms to purchase plant materials
      1) Balled and burlapped plants
      2) Container-grown plants
      3) Bareroot plants
4. Wall and bed materials
5. Weak barriers
6. Mulches
7. Edgings
8. Walkway and patio materials

TREES

LANDSCAPE QUALITIES	COMMON NAME	BOTANICAL NAME
	Arborvitae	Thuja occidentalis
*	Beech	Fagus sp.
*	Black gum	Nyssa sylvatica
	Cedar	Juniperus virginiana
	Cherry, Choke	Prunus sp.
*	Crabapple	Malus sp.
*	Dogwood	Cornus sp.
*	Hackberry	Celtis occidentalis
*	Hawthorn, (Cockspur, Washington)	Crataegus sp.
	Hickory	Carya sp.
*	Maple	Acer sp.
*	Mountain Ash	Sorbus aucuparia
	Mulberry	Morus rubra
*	Oak (Black Jack, Pin, Post, Red, White)	Quercus sp.
*	Pecan	Carya illivoensis
	Persimmon	Dospyros virginiana
*	Pine (White, Scotch)	Pinus sp.
*	Redbud	Cercis canadensis
*	Russian Olive	Elateagnus angustifolia
*	Sassafras	Sassafras albidum
*	Spruce	Picea sp.
*	Sweetgum	Liquidambar styraciflua
	Walnut	Juglans nigra

* Landscape qualities include shape of the plant, ornamental flowers or fruit, and plant health.

PLANTS FOR WILDLIFE FOOD AND NESTING continued

SHRUBS

LANDSCAPE QUALITIES	COMMON NAME	BOTANICAL NAME
	Autumn Olive	Elaeagnus umbellata
*	Barberry	Berberis sp.
	Blackberry	Rubus laciniatus
	Buckthorn	Rhamnus lanceolata
	Button Bush	Cephalanthus occidentalis
*	Cottoneaster	Cotoneaster sp.
	Current	Ribes sp.
	Dewberry	Rubus flagellaris
*	Dogwood-(Cornetan Cherry, Grey, Redosier)	Cornus sp.
	Elderberry	Sambucus canadensis
*	Firethorn	Pyracantha sp.
	Gooseberry	Ribes missouriense
*	Hazelnut	Gorylus Americana
*	Holly - Deciduous	Ilex decidua
	- Evergreen	
*	Honeysuckle, (Morrow, Amur, Tatarian)	Lonicera
	Nanking Cherry	Prunus tomentosa
*	Ninebark	Physocarpus opulifolius
	Plum	Prunus sp.
*	Privet, Amur	Ligustrum sp.
	Raspberry	Rubus sp.
*	Serviceberry	Amelan chier "Canadensis"
	Sumac (Fragrant, Smooth)	Rhus
*	Viburnum, (Blazkhaw, Arrowwood, Cranberry Bush)	Viburnway
*	Virginia Creeper	Parthenocissus quinque "Folia"

* Landscape qualities include shape of the plant, ornamental flowers or fruit, and plant health.

TREES

COMMON NAME	BOTANICAL NAME
Bald Cypress	Taxodium distichum
Beech	Fagus sp.
Blackgum	Nyssa sylvatica
Bradford Pear	Pyrus callerana "Bradford"
Crabapples	Malus sp.
Dawn Redwood	Metasequola glyptostroboides
Ginkgo	Ginkgo biloba
Golden-rain tree	Koelreuteria paniculata
Hawthorn Washington	Crataegus phaenopyrum
Hemlock, Canadian	Tsuga canadensis
Honeylocust, Thornless	Gleditsia triacanthos inermis
Hornbeam, European	Carpinus betulus
Japanese Pagoda Tree	Sophora japonica
Linden	Tilia sp.
Maple, Red	Acer rubrum
Oak, Red	Quercus borealis
Pines (Austrian, Scotch, White)	Pinus sp.
Smoke Tree	Cotinus coggygria
Spruce, Norway	Picea abies
Sweetgum	Liquidamber styraxiflua
Zezkova	Zelkova serrata

SHRUBS

COMMON NAME	BOTANICAL NAME
Barberry	Berberis thunbergil
Burning Bush	Euonymus alatus "Compacta"
Flowering Quince	Chaenomeles sp.
Holly	Ilex sp.
Junipers	Juniperous sp.
Pine, Mugo	Pinus mugo 'Mughus'
Potentilla	Potentilla gruticosa
Spirea, Anthony Waterer	Spirea bumalda
Viburums	Viburnum sp.
Yews	Taxus sp.

PERENNIALS

COMMON NAME	BOTANICAL NAME
Yarrow	Achillea sp.
Garden Mum	Chrysanthemum hybrids
Shasta Daisy	Chrysanthemum maximum
Coreopsis	Coreopsis lanceolata
Bleeding Heart	Dicentra spectabilis
Purple cornflower	Echinacea purpurea
Day Lily	Hemerocallis hybrids
Hosta or Plaintain Lilly	Hosta sp.
Lily Turf	Liriope spicata
Peony	Paeonia lactiflora
Garden Phlox	Phlox paniculata
Creeping Phlox	Phlox sublata
Rudbeckia or Black-eyed Susan or Gloriosa Daisy	Rudbeckia hirta
Sedum or Stone Crop	Sedum sp.
Golden Rod	Solidago canadensis

ANNUALS

COMMON NAME	BOTANICAL NAME
Snapdragons	Antirrhinum majus
Begonia	Begonia semperflorens
Celosia or Cockscomb	Celosia agrentea
Cleome or Spider Flower	Cleome spinosa
Coleus	Coleus blumei
Impatiens	Impatiens wallerana
Basil	Ocimum basilicum
Petunia	Petunia hybrida
Salvia	Salvia splendens
Dusty Miller	Senecio cineraria
Marigold	Tagetes sp.
Periwinkle or Vinca	Vinca rosea
Zinnia	Zinnia elegans

Tree	Pruning requirements	Large leaves require raking	Drop limbs easily	Trashy	Do not use close to drives or walks	Pest problems	Comments
Sycamore		X				X	
Pin Oak	X				X	X	Low branches major problem; use red oak instead
Silver (soft) Maple			X				Grows fast but breaks easily; use red maple instead
Crabapples					X		
Walnuts				X			
Mulberry				X	X		After birds eat fruit, bird droppings will stain cars
American Elm			X			X	Can die from Dutch elm disease
Siberian Elm			X			X	
Pfitzer Juniper	X					X	Easily outgrow location
Upright Juniper	X					X	Require excessive pruning
Hackberry						X	Witches broom and nipple gall
Cottonwood				X			Cotton clogs air conditioners
Lumbardy Poplar						X	Dies back easily
Willow				X	X		
Common Lilac	X					X	
Azalea							Require regular acidic fertilizations
Rhododendron							Require regular acidic fertilizations
Mimosa							Dies back in cold winters
Osage Orange				X	X		Thorns; large fruits
Manhattan Euonymus						X	Winter kill; crown gall
Red Cedars						X	Alternate host for cedar-apple rust; bagworms
Catalpa		X		X			

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 3: Selecting Plants for the Landscape Plan

A. Review

1. Which plants can be used for specimen plants?
2. Which plants are used for windbreaks and screening?
3. What site factors are students considering in their site analysis?
4. What plants can help conserve energy?
5. What plants can be used in shrub borders?
6. What trees make good shade trees?
7.
8.

Note: Students should refer to their completed Home-Needs Assessment (HO 1.3) when selecting plants for their landscape plans.

B. Objective: The student will be able to select plants to use in his or her landscape plan.

NOTE: Three teaching options are provided for this lesson. The instructor will need to select the option that best fits his or her class and teaching situation.

OPTION A - TEACHER DIRECTED

C. Motivation

Many people have questions as to what plants should be used for specific purposes, tonight we will try to solve some of the selection problems that you are having. The class will also draw rough sketches of their homes.

D. Outline (NOTE: This is an outline for the teacher not an outline of information.)

1. List student problems and concerns on the chalkboard.

   a. Have the students each give problem areas in their landscapes.
   b. Possible things to consider
      1) Entry areas
      2) Windbreaks
      3) Screening views
      4) Wildlife areas
      5) Patio areas
      6) Energy conservation
      7) Play areas
      8) Continual color
      9) Plants with fruit displays
      10) Plants with flower displays
      11) Maintenance level of the plant
      12) Consider other characteristics including the plant's size, shape, and rate of growth.

2. **Have students work in small groups.**

   a. Break into groups of four or five people and discuss ways to solve the individual concerns listed on the chalkboard.
   b. Have the groups choose a reporter to write down suggestions.
   c. Have the groups choose an individual to report their suggestions.
   d. Allow students 10-15 minutes to work.

3. **Discuss results as a group.**

   a. Have the small groups report on their suggestions.
   b. Discuss the ideas as they are mentioned.

4. **Have students work on individual landscape plans.**

   a. Have students refer to their Home-Needs Assessment (HO 1.3) for items they need to consider when drawing their landscape plans.
   b. Have students use class suggestions, plant lists, and teacher assistance to place plants on their landscape plans.
   c. Make sure students are considering plants' height and spread, maintenance considerations, and general landscape quality in their plant selections.

OPTION B - USING A RESOURCE PERSON

C. Motivation

Many people have questions as to what plants should be used for specific purposes. Tonight we have a person who handles these types of questions every day.

D. Outline (NOTE: This is an outline for the teacher not an outline of information.)

1. **Choosing a resource person**

   a. Choose a resource person to present a talk on specific aspects of landscaping such as:
      1) Plants with good landscaping qualities
      2) New trends in landscaping
      3) Specialty plants such as conifers and plants for the shade.
      4) How to place plants on their landscape plans
   b. Nursery persons or landscapers will have a good practical knowledge of landscape plants.
   c. If your county extension agent has expertise in horticulture, he or she could be a good resource person.

2. **Preparing the resource person**

   a. Explain what group you have in class.
   b. Give the date and time of the presentation and give them an idea of the length of the talk.
   c. Determine if they need any special equipment for the presentation. Be sure it is operational before the speaker arrives.
   d. Let the resource person know what has been taught and the material you would like covered in class.

3. **The presentation**

   a. Introduce the speaker and explain his or her qualifications.
   b. Assist in handling questions or asking questions to direct the discussion.

4. **Have students work on individual landscape plans.**

   a. Have students refer to their Home-Needs Assessment (HO 1.3) for items they need to consider when drawing their landscape plans.
   b. Have students use class suggestions, plant lists, and teacher and resource person assistance to place plants on their landscape plans.
   c. Make sure students are considering plants' height and spread, maintenance considerations, and general landscape quality in their plant selections.

OPTION C - FIELD TRIP

C. Motivation

Trees and shrubs are hard to visualize just from descriptions. Actually going to view plants is the best way to see their qualities and uses.

D. Outline (NOTE: This is an outline for the teacher not an outline of information.)

1. **Select a field trip site.**

   Determine the need of the students.
   a. If a knowledge of the plant materials is needed go to a nursery or arboretum (a place to view the growth habits of trees, shrubs, and flowers). Examples of arboretums or public gardens follow.
      1) Missouri Botanical Garden (Shaw Gardens) in St. Louis, Missouri
      2) Landscaping on the University of Missouri-Columbia campus
      3) Powell Gardens in Kansas City, Missouri
   b. If the students need to see plants used in landscapes, try to arrange a tour of well-landscaped lawns. Possible sources of homes to visit may come from:
      1) Landscapers/nursery persons
      2) Garden clubs
      3) County extension agent
      4) Chamber of commerce
   c. Also, do not rule out visiting well-landscaped public or private buildings.

2. **Prepare students for the trip.**

   a. Determine how to get there. Adults can usually drive themselves or ride together.
   b. Give an estimated cost requirement if admission fees are charged.
   c. Decide if the trip can be taken in one evening or if a Saturday will be required to get to the destination.

3. **Have students work on individual landscape plans after the trip.**

   a. Have students refer to their Home-Needs Assessment (HO 1.3) for items they need to consider when drawing their landscape plans.
   b. Have students use information gained during the field trip, suggestions made by the class, plant lists, and teacher assistance to place plants on their landscape plans.

c. Make sure students are considering plants' height and spread, maintenance considerations, and general landscape quality in their plant selections.

E. Group Discussion

F. Summary and Conclusions

1. Summarize the information that was obtained from the lesson activity.
2. Talk about the landscape qualities that were seen or talked about.
3.
4.

G. Announcements and Social

H. Materials

The materials for this lesson will depend on which teaching option is selected.

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 4: Landscape Installation and Care

A. Review

From Option A

1. What problems did the students have with their landscapes?
2. What plants did they decide to use in their designs?
3. What type of planting will help reduce heating costs?
4.
5.

From Option B

1. What plants did the students decide to use in their landscape designs?
2. Who was the resource person from last week and what did they talk about?
3.
4.

From Option C

1. What plants did the students decide to use in their landscape designs?
2. Where did the class go on the field trip and what did they see?
3.
4.

B. Objectives

The students will be able to:

1. Explain how to plant B & B, bareroot, and container-grown trees and shrubs.
2. Explain how to mass plant ground covers and flowers.
3. Explain what care should be given to plants at the time of planting.

C. Motivation

1. Ask the students if they have ever had a newly transplanted tree die. Discuss what might have caused it to die. Possible causes may include: planting the tree too deep or too shallow, not watering it properly after it was planted, and not staking the tree properly.
2. Tell the students if they plant trees themselves, they can save the labor cost, which could be up to 50 percent of the tree's value. If a tree costs $80.00, that could be a savings of $40.00 for the hour of work required to plant the tree.

D. Key Points

1. Site preparation
2. How to plant landscape plants
3. Care at time of planting
4. When to plant trees and shrubs

E. Introduction of Information (**Distribute HO 4.1, outline.**)

1. **Site preparation**

a. Soil amendments - Some soils require the addition of amendments depending on the soil type. Mix in generous amounts of rotted manure or peat moss to the topsoil removed from planting holes.

b. Drainage **(TM 4.1)**

1) Most planting sites will require no additional drainage. Most sandy or loam soils will not have problems.

2) In areas where water stands in some seasons, drainage will need to be added. Water drainage can be accomplished by using drainage pipe to carry the water away from the plant. It may also be accomplished by raising the low area or adding a gravel bed under the planting area to improve drainage.

2. **Planting landscape plants**

a. B & B (balled and burlapped)

1) Dig the hole no deeper than the soil ball. Also, dig the hole at least six inches wider than the soil ball.

2) Use your shovel as a measuring stick to check the depth of the hole. When planting trees or shrubs on a slope, make the bottom of the ball at the level of the lower part of the slope. **(TM 4.2)**

3) After the correct depth is achieved, place the ball in the hole. Handle the ball gently. Do not cut strings until you are sure it fits. **(TM 4.3/HO 4.2)**

4) Cut all strings around the trunk. They can girdle the tree. Pull down 3"-4" of the burlap. If the ball is wrapped in a fiberglass grow bag, it must be removed before planting.

5) Backfill the hole with good topsoil.

6) With the excess soil, build a dish around the inside edge of the planting hole.

7) Slowly water the plant until the water fills the dish. It is best to push the hose through the loose soil of the planting hole to get water to the bottom of the hole. **(TM 4.3/HO 4.2)**

b. Bareroot **(TM 4.4/HO 4.3)**

1) The roots of the bareroot plant need to be kept moist before they are planted. Keep them in moist peat moss, not a bucket of water. Bareroot plants should be soaked 2-24 hours before planting.

2) Dig the hole deep and wide enough so the roots do not have to be bent.

3) Use loose fill dirt to make a mound in the bottom of the hole to help spread out the roots. Without a mound, the roots may be crowded together. This could prevent the development of a good root system.

4) Prune off any damaged or diseased roots.

5) Backfill the hole with good topsoil.

6) With the excess soil build a dish around the inside edge of the planting hole.

7) Slowly water the plant to the top of the dish.

c. Container-grown **(TM 4.5)**

1) Dig the hole slightly deeper than the original depth of the plant and refill the bottom with loose fill soil. Also dig the hole a few inches wider than the container width.

2) Use your shovel as a measuring stick to check the depth of the hole.

3) Remove it from the pot and place it in the hole.

(a) When the plants are in plastic pots, turn them upside down and tap gently on the bottom and sides to allow the pot to be removed.

(b) When the plants are in fiber pots, cut or tear the pot below the soil level

and off the bottom. It is all right to remove the entire pot.

(c) When the plants are in metal cans, the cans must be cut at the nursery. Keep the can around the plant until you are ready to plant it.

(d) If the roots are pot bound, spiralling around the rootball, a knife should be used to cut through the roots in several places.

4) Backfill the hole with good topsoil.

5) With the excess soil, build a dish around the inside edge of the planting hole.

6) Slowly water the plant to the top of the dish.

d. Ground covers and mass plantings

1) First, lay out the area to be planted.

2) Prepare the site by tilling the soil four inches deep, mixing in a two-inch layer of peat moss, compost, or manure. Fertilizer may be added at this time.

3) Decide what spacing will be needed between plants; refer to plant selection tables or a gardening book for spacing requirements. You may lay out the spacing in the flower beds with string, or just estimate it. For some ground covers, you should mulch before planting. Then, plant through the mulch.

4) Using a trowel, dig holes deep enough to cover the original block of soil. Since the soil has been loosened by tilling, this step should be easy. The process may be quickened by digging several holes at one time. **(TM 4.6)**

5) Next, take the plants out of the packs or pots and place them by the hole where they will be planted. Do several at once to save time.

6) Next, cover the soil of the plant and firm it with your hands making sure the original soil block is covered. **(TM 4.7)**

7) At planting time, overgrown plants should be pinched in relation to their root systems.

8) Water by hand at low pressure or use a sprinkler.

3. Care at time of planting

a. Staking **(TM 4.8/HO 4.4)**

1) Why should trees be staked?

(a) It provides extra support for newly transplanted trees.

(b) Staking provides support for the tree while it is getting established. If support is not provided, the roots may be broken as the wind moves the top of the tree.

(c) As a general rule, stakes should be removed after one growing season.

2) Which method is best?

(a) For smaller trees up to 1 1/2" in diameter the one-stake or slant methods will work fine.

(b) With trees from 1 1/2"-3", the two- or three-stake methods work fine.

(c) Larger trees should be guyed. When guying trees, use turnbuckles to keep the wires snug and use hazard markers to prevent people from tripping over the wires.

b. Mulching **(TM 4.9)**

1) Why should plants be mulched?

(a) Mulching newly planted plants helps reduce moisture loss.

(b) It will also keep grass and weeds from growing too close to new plants.

2) Materials

(a) Bark mulch works best. It allows water and air to pass through but doesn't mat down. Apply it 3"-5" thick.

c. Wrapping and protection **(TM 4.9)**

1) Why should trees be wrapped?

(a) Not all trees need to be protected. The main trees that need wrapping are trees with smooth thin bark, which are affected by wind, sun scald, and

frost crack.

(b) Other reasons to wrap trees are to reduce borer and rodent damage and to reduce moisture loss.

2) How to wrap a tree

(a) Start at the bottom and wrap up the tree to the first main branch. Overlap half of the previous wrap. This overlapping method helps shed water.

(b) At the top of your wrapping, secure it with black electrical tape or string.

3) Tree wrap may be left on for up to two years, but it may need adjusting after one year. When you remove the wrap, do it in the beginning of the growing season.

4) Winter protection from rodents can be achieved with small wire mesh or hardware cloth. Starting at ground level, wrap the tree up to six inches above the predicted snow line.

d. Watering

1) Water every 7-10 days on the average. Try to avoid overwatering or underwatering. Plants can die from drowning, due to a lack of oxygen.

2) The use of mulch around the plant may lessen the water requirements.

3) It is better to water at a very low pressure, so that the water will go deeper in the soil.

e. Fertilization

1) Newly planted trees and shrubs are normally not fertilized at the time of planting.

2) If you feel a need to fertilize, use a slow release or organic fertilizer and avoid contact with the roots.

3) Vitamin B solutions are used at planting time to help stimulate new root growth.

f. Pruning **(TMs 4.10 and 4.11)**

1) B & B and container-grown plants only require damaged, dead, or diseased branches to be removed.

2) Bareroot plants should have damaged, dead, or diseased branches and roots removed. Also, 25 to 35 percent of the top growth should be removed to keep the top in balance with the root system.

4. When to plant trees and shrubs

a. Season

1) The best time is generally when the plant is dormant. This would be early spring or fall.

2) Bareroot plants usually need to be planted in the spring.

3) Evergreens can be planted from September to June.

4) If plants are planted in the summer they will need special care, including wind protection and more frequent waterings. Antitranspirants may be used to help reduce the moisture loss. Antitranspirants slow down the transpiration of the plant by putting a thin waxy film on the leaves.

b. Time of day - It is best to plant in the morning when it is cool.

F. Group Discussion

G. Summary and Conclusions

1. Container-grown and B & B plants have different planting requirements than bareroot plants.
2. Ground covers and flowers are easy to plant if the site has been tilled in advance.
3. Trees usually need to be staked, mulched, wrapped, watered, and pruned at time of planting.
4. Most trees and shrubs should be planted in early spring or in the fall when the plants are dormant.
5.
6.

H. Announcements and Social

I. Materials

1. Instructor

a. Transparency Masters (TMs 4.1-4.11)

2. Student

a. Handouts (HOs 4.1-4.4)

3. Supplementary Resources

a. O'Banion, B.J. Landscaping Your Home (Teacher Guide). Columbus, OH: Ohio Agriculture Education Curriculum Materials.

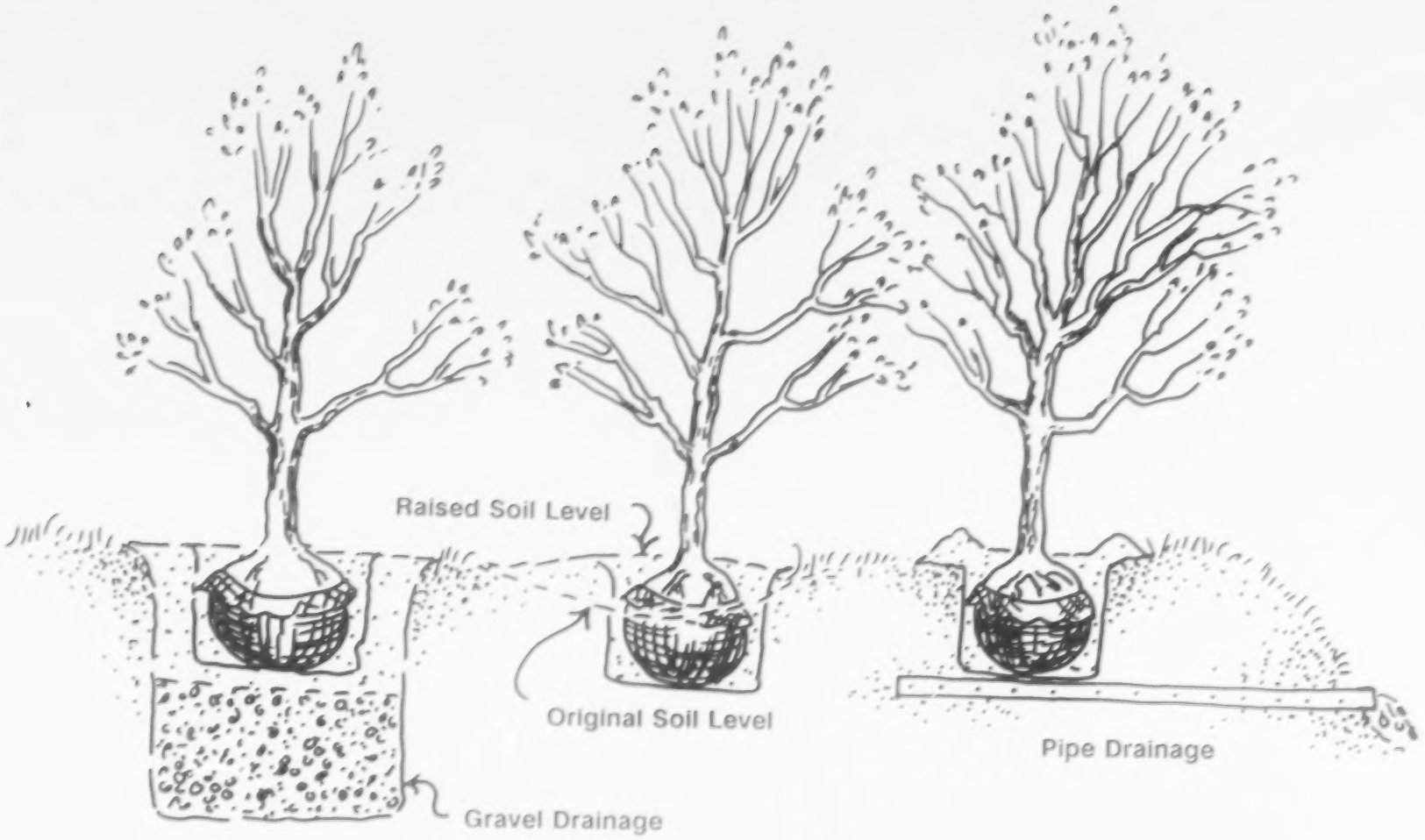
b. Ingels, Jack E. Landscaping. 2nd ed. Albany, NY: Delmar Publishing Inc., 1983.

c. Wirth, Thomas. The Victory Garden Landscape Guide. n.c.: Little, Brown, and Company, 1984.

4. Supplementary Activities

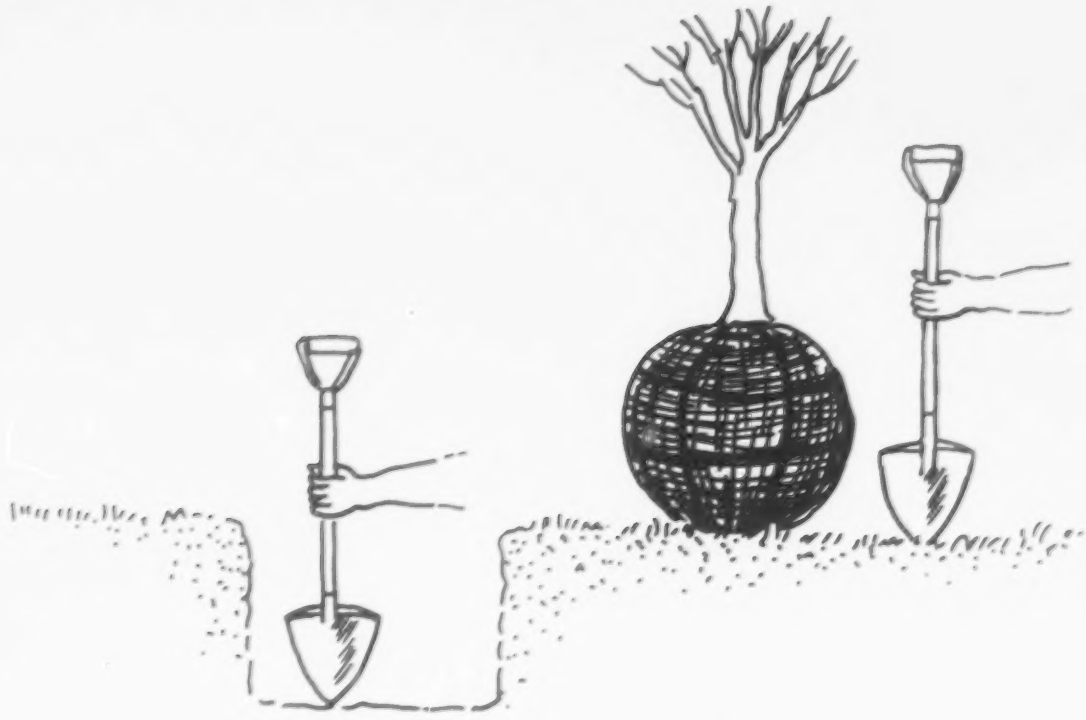
a. Have students practice planting trees, shrubs, or other plant materials.

Drainage

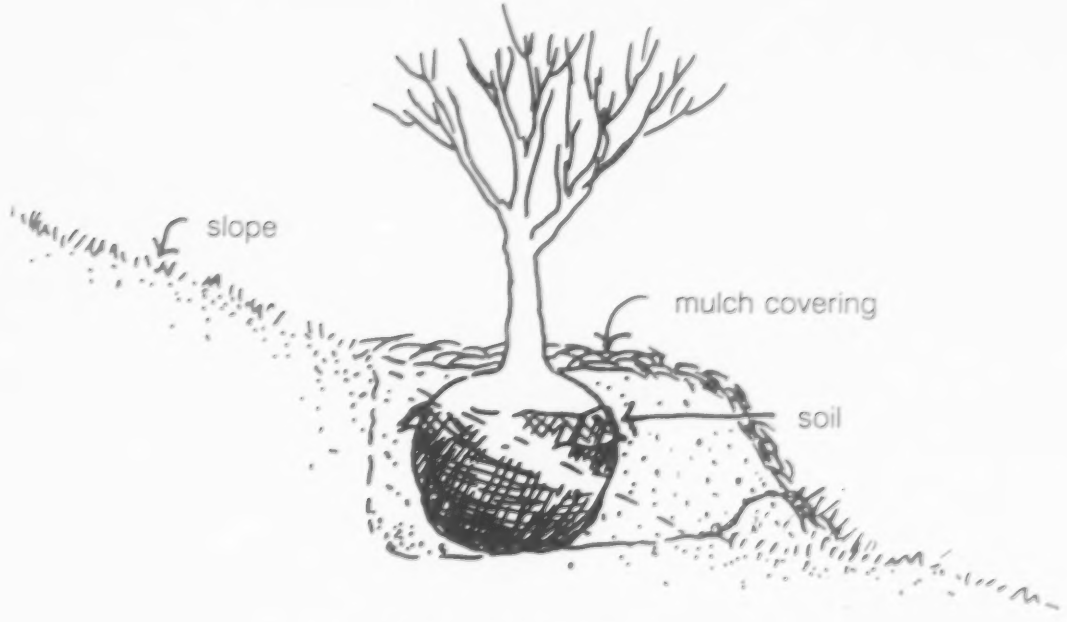


TM 4.1

Planting Depth

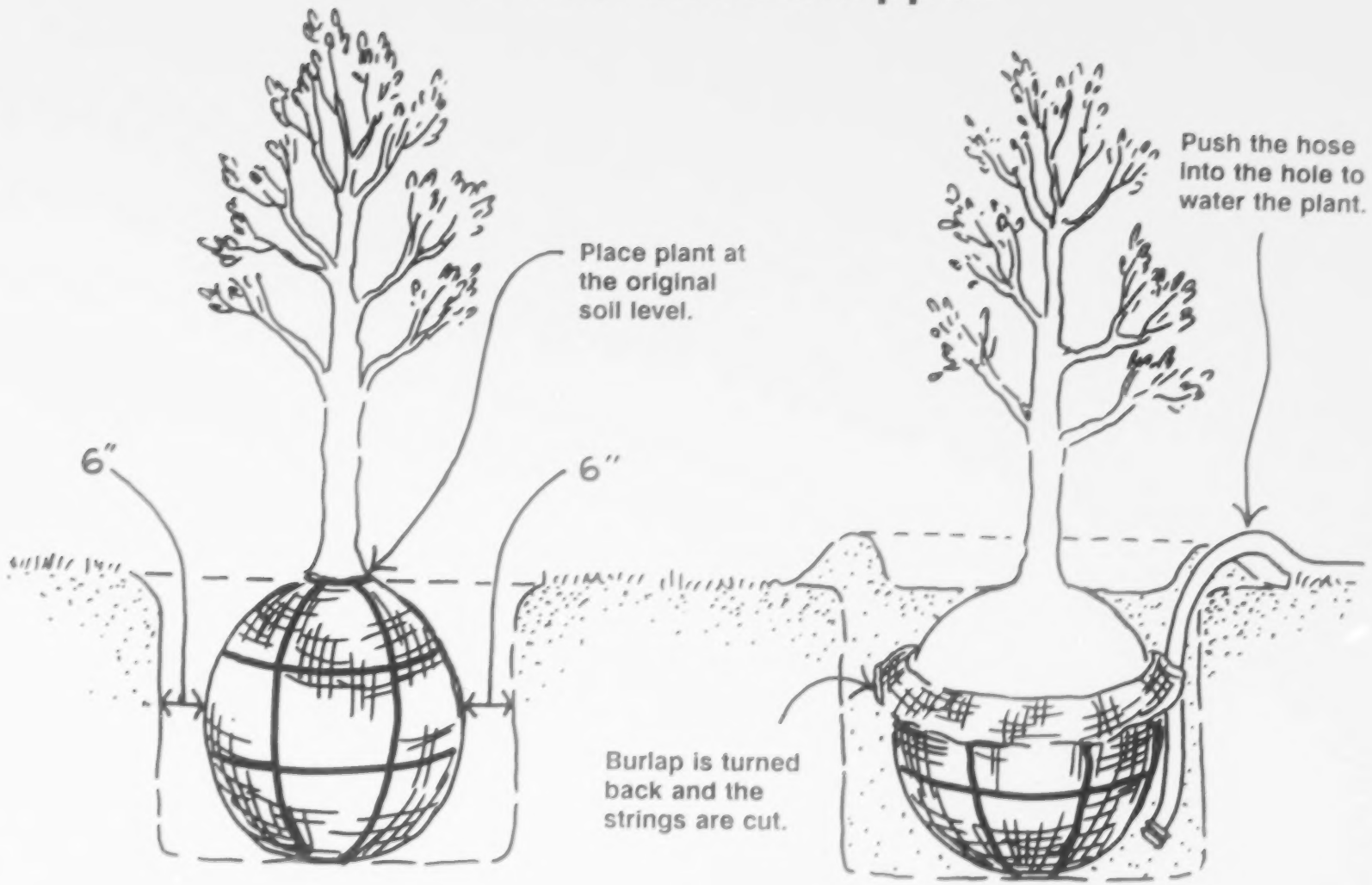


Shovel Used as a Measuring Stick

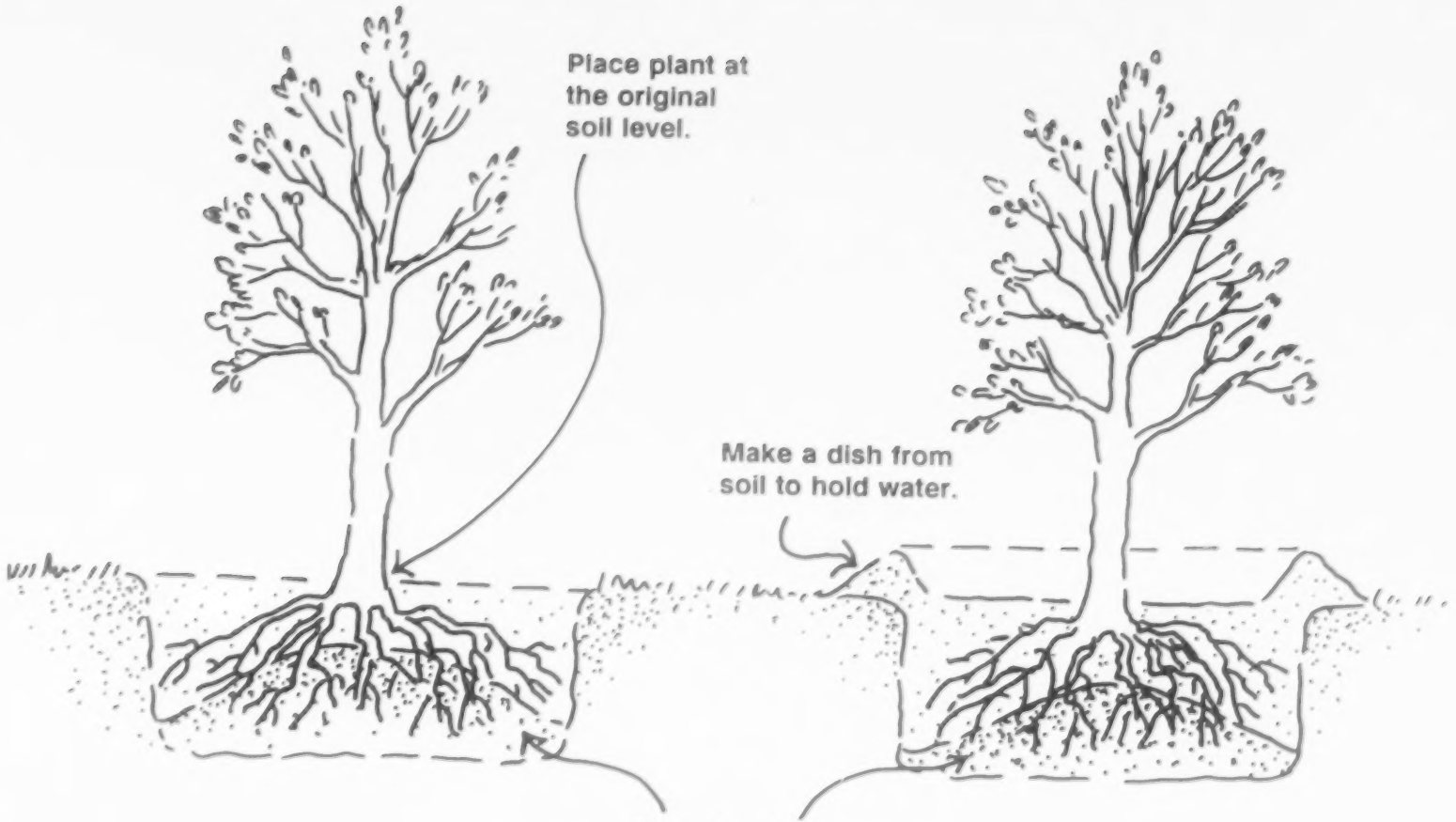


Planting on a Slope

Balled and Burlapped

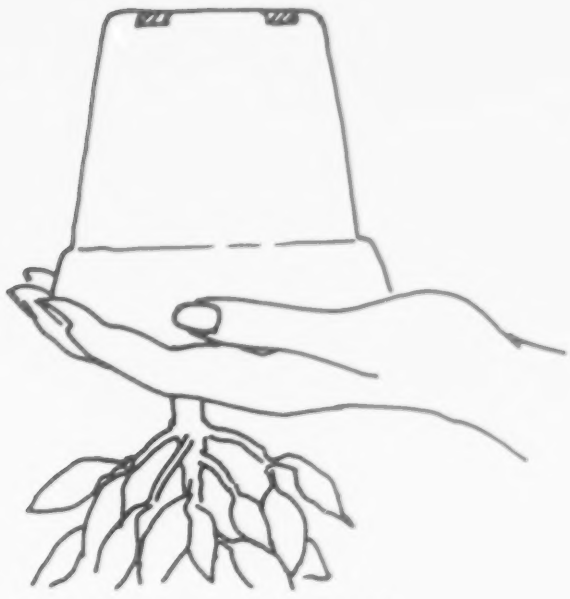


Bareroot


Place plant at the original soil level.
Make a dish from soil to hold water.
Mound soil to help spread out roots.

Container-Grown Plants

Plastic Pots



Turn plant upside down and pat gently to remove pot.

Metal Cans

Cans should be cut at the nursery.

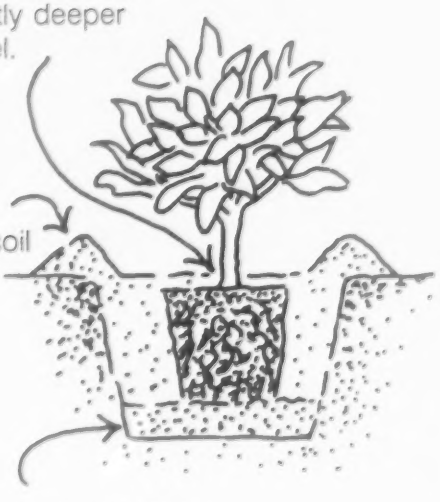
Fiber Pots

Cut or tear the pot below soil level and the bottom of the pot.

All Container-Grown Plants

Place the plant slightly deeper than the original level.

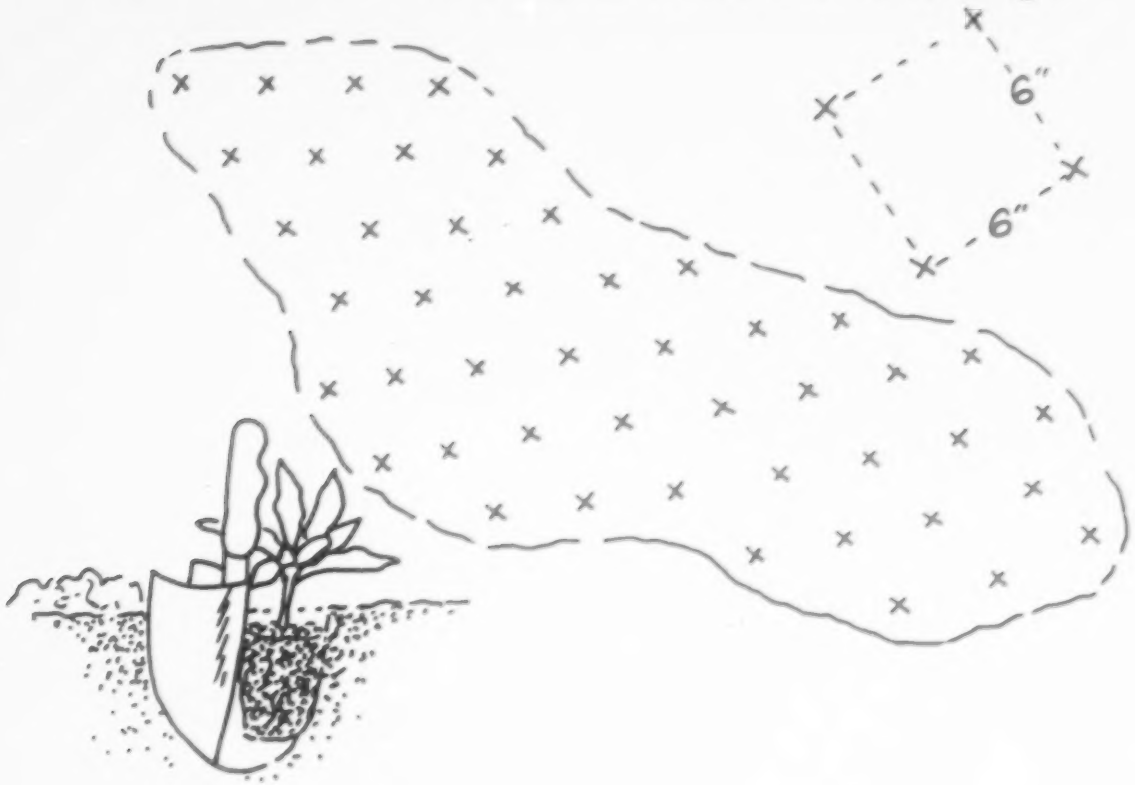
Make a dish from soil to hold water.

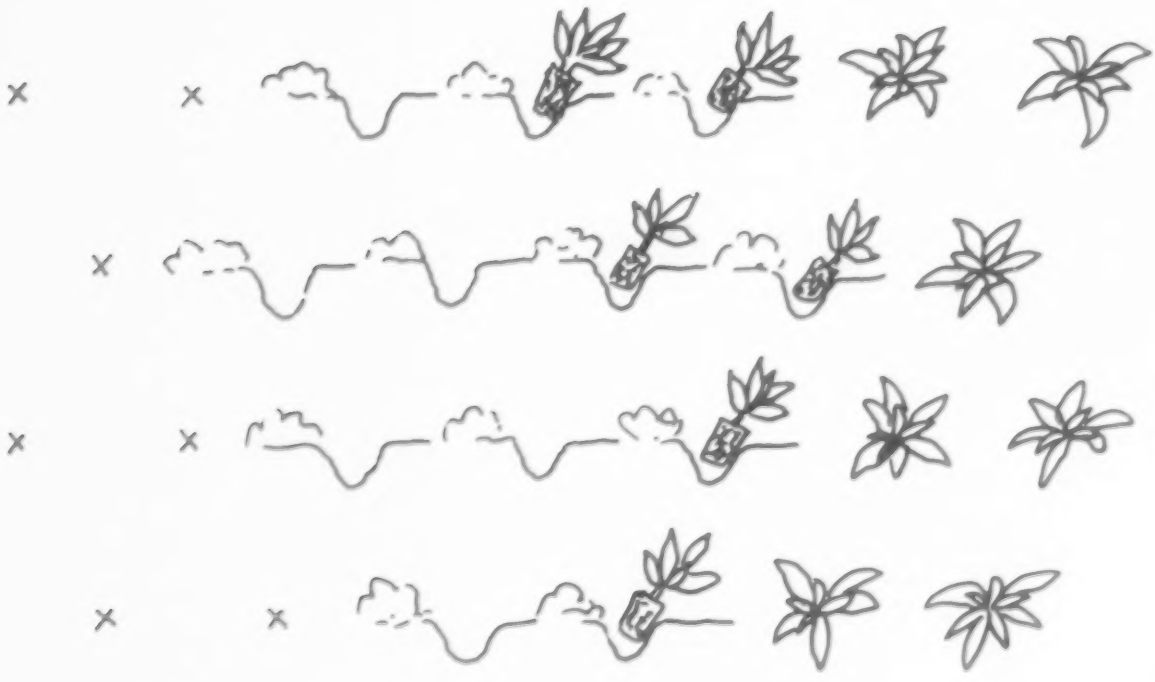


loosened soil

Ground Covers and Mass Plantings

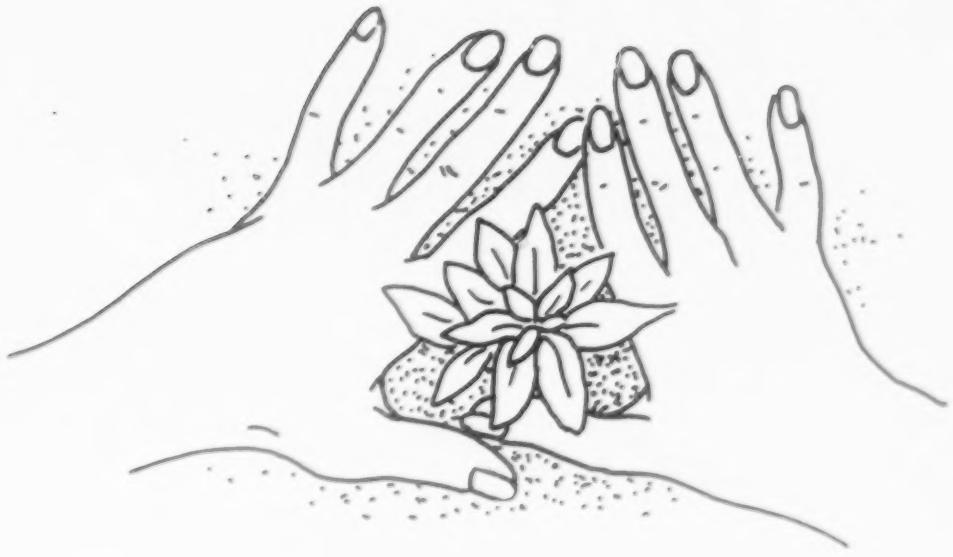
TM 4.6



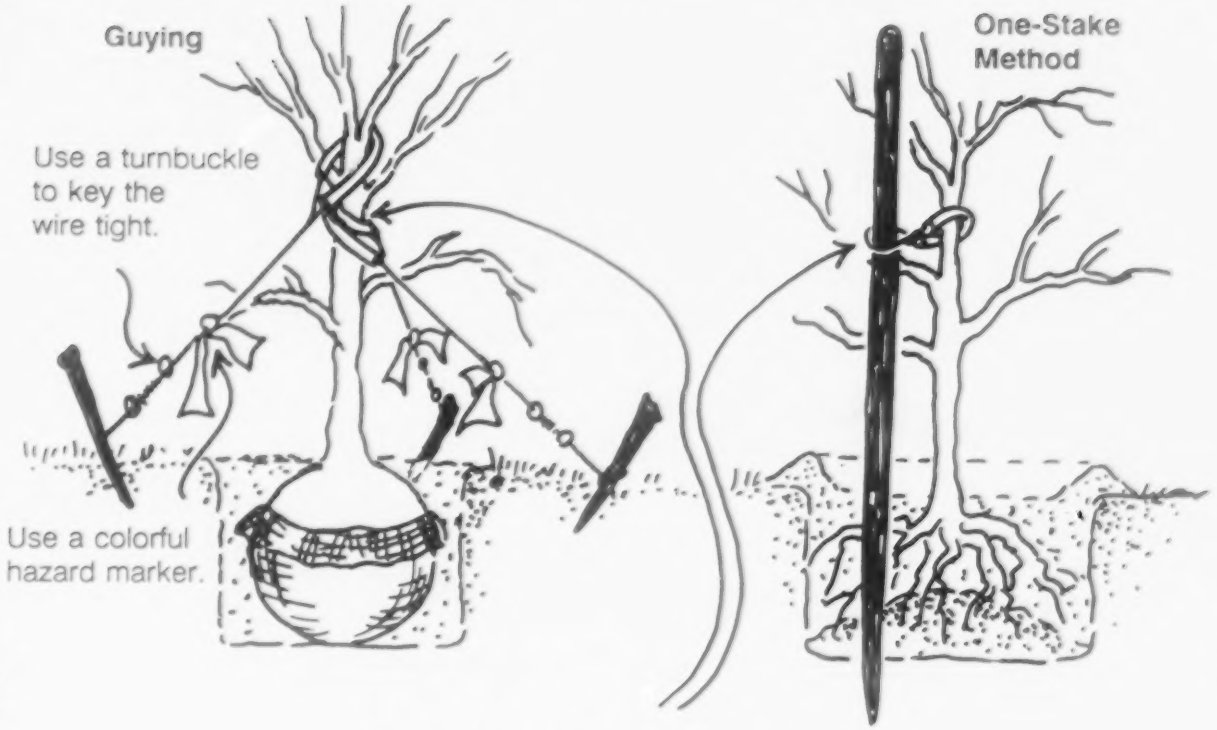


Step 1 Step 2 Step 3 Step 4

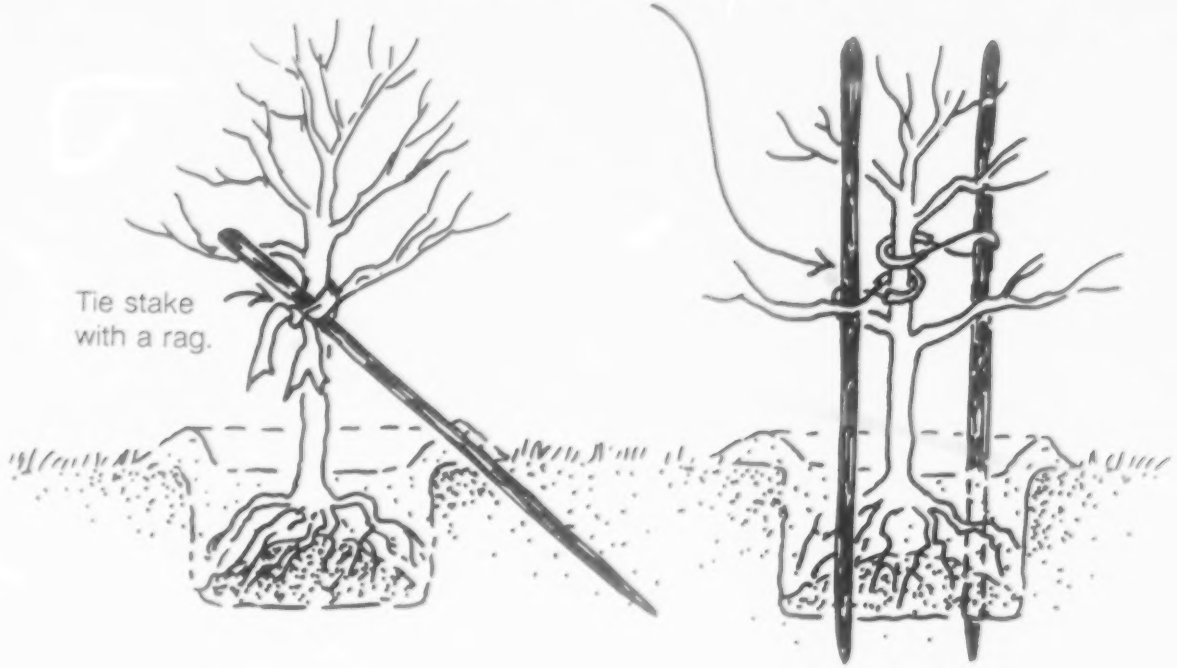
Firming the Soil



Staking and Guying



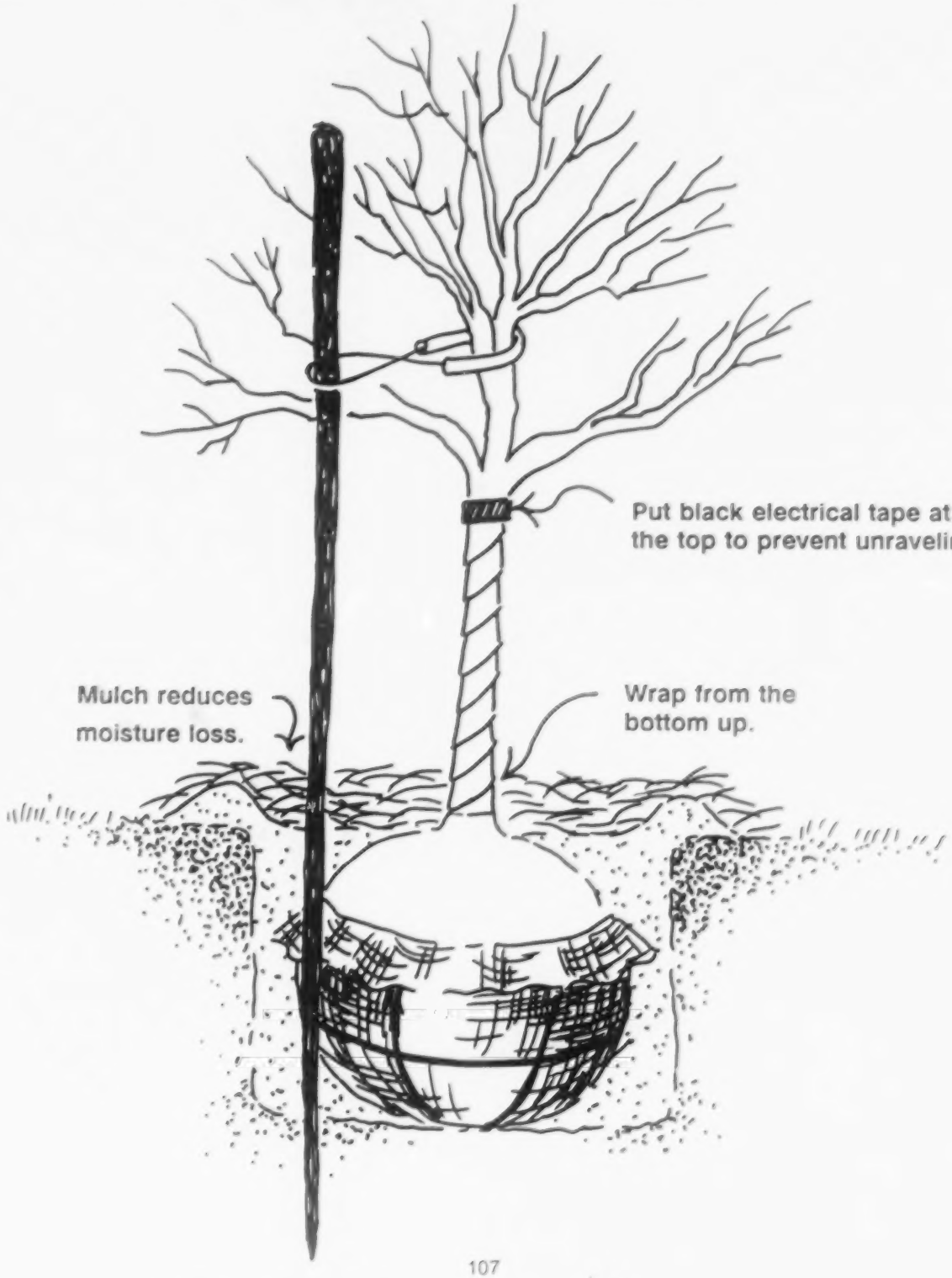
Wires should be inserted into pieces of water hose to prevent injury to the tree.



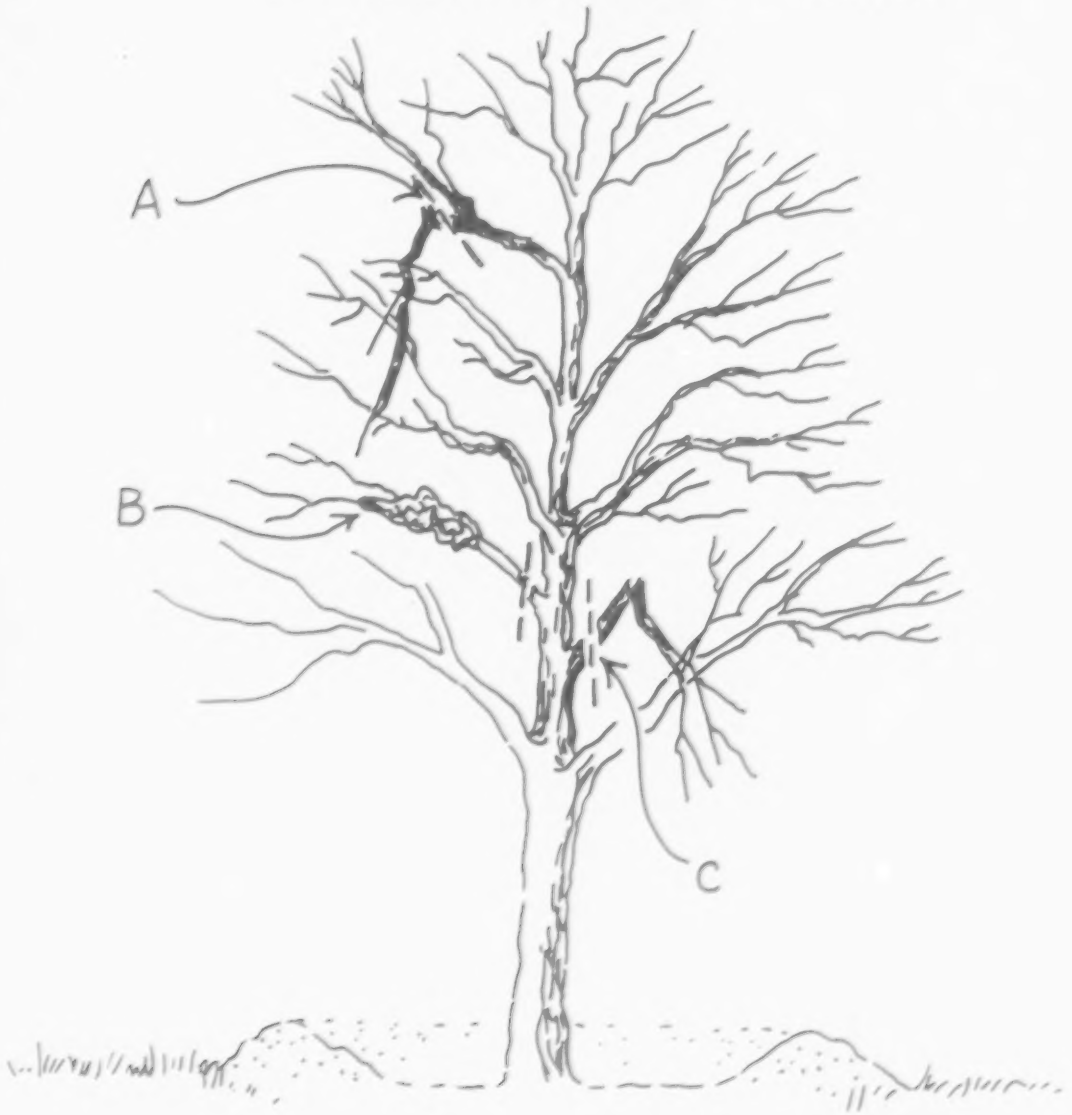
Slant Method

Two- or Three-Stake Method

Mulching and Wrapping



Pruning B & B and Container-Grown Plants



A - Broken branch is cut back to next main branch.
B - Diseased branch is removed.
C - Broken branch is removed.

Pruning Bareroot Plants

A, B, and C - Same as B & B and container-grown plants
D - Top growth is pruned back to main limbs to keep the top in balance with the root system.

Lesson 4: Landscape Installation and Care

OUTLINE

1. Site preparation
   a. Soil amendments
   b. Drainage
2. Planting landscape plants
   a. B & B
   b. Bareroot
   c. Container-grown
   d. Ground covers and mass plantings
3. Care at time of planting
   a. Staking
      1) Why should trees be staked?
      2) Which method is best?
   b. Mulching
      1) Why should plants be mulched?
      2) Materials
   c. Wrapping and protection
      1) Why should trees be wrapped?
      2) How to wrap a tree
      3) Length of time for tree wrap to remain on the tree
      4) Winter protection from rodents
   d. Watering
   e. Fertilization
   f. Pruning
4. When to plant trees and shrubs

a. Season

b. Time of day

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 5: Landscape Maintenance

A. Review

1. How is planting a bareroot tree different from a B & B tree?
2. What are some things that could be done to a tree at time of planting?
3. When is the best time to plant trees and shrubs?
4.
5.

B. Objectives

The student will be able to:

1. Explain the basic techniques in pruning.
2. Explain how to diagnose pest problems.
3. Explain how to fertilize trees.
4. Explain how mulch benefits landscape plants.

C. Motivation

1. Explain that landscaping plants are a major investment. If they are maintained properly, they will grow, flower, and fruit better.
2. Show the students slides of topped trees and point out that they will learn the correct methods to care for trees.
3. Display pruning tools. Ask students who has used any of the tools before. Possibly have them tell how they are to be used.

D. Key Points

1. What are the basics of pruning?
2. Pruning tools
3. Pruning trees
4. Pruning deciduous shrubs
5. Pruning evergreens
6. Pruning hedges
7. Controlling pests on ornamental plants
8. Fertilizing trees and shrubs
9. Mulching landscape plants
10. Watering trees and shrubs

E. Introduction of Information (**Distribute HO 5.1, outline.**)

1. **Pruning basics**

a. Pruning small branches (**TM 5.1**)
   1) Cut above an outward facing bud.
   2) Cut 1/4 inch above the bud with a slanting cut. A slanting cut will help shed water.
   3) Cutting off the terminal bud will cause the lateral buds to grow, causing thicker plant growth.

b. Pruning larger branches **(TM 5.2)**
   1) Make cuts at the main branch.
   2) When pruning branches over two inches in diameter, it is best to use a 3-cut method. This will lessen the chance of the weight of the branch to cause the bark to rip.

c. Pruning safety
   1) Wear leather gloves to protect your hands.
   2) Wear eye protection when using a saw.
   3) Watch out for other people.

2. **Pruning tools (TM 5.3)**

a. Pruning shears
   1) They will cut limbs up to 1/2" in diameter.
   2) There are two types of shears: scissors and anvil. Scissors-type shears usually do a better cutting job.

b. Lopping shears (loppers)
   1) They will cut branches up to 1 1/2" in diameter.
   2) Loppers will cut larger limbs than pruning shears because they give greater leverage.

c. Hedge shears
   1) They are not selective. They will cut many branches at one time.
   2) They can cut limbs up to 3/8".
   3) They are only used for formal shrubs and hedges.
   4) Electric shears are available.

d. Pruning saws
   1) Small pruning saws will sometimes fold, making them easy to carry.
   2) Pruning saws work best with branches too large for loppers.
   3) Bow saws have replaceable blades.

e. Pole pruner/saw
   1) Combinations of pole pruners and pole saws are available.
   2) Pole pruners may reach up to 16 feet into the tree.

f. Tool maintenance
   1) Keep tools sharp. They will be easier to use and less likely to damage the tree.
   2) After use, clean the tools with solvent and wipe clean with an oily cloth.

3. **Pruning deciduous trees (TM 5.4/HO 5.2)**

a. First, prune for the tree's health
   1) Remove broken, dead, and diseased branches.
   2) With crossing branches, remove the weaker branch. Constant rubbing will provide a site for disease and insect entrance.
   3) Remove stubs.
   4) Remove girdling roots. They can reduce nutrient and water intake.
   5) Remove double leaders while the tree is young.

b. Next, prune for safety
   1) Prune branches before they cause problems with the home.
   2) Do not allow limbs to get into utility lines. If they are already there or are close, call the utility company. The utility company will be glad to help with the problem by doing the work or referring you to a professional.
   3) Keep limbs clear of sidewalks and roads. Do not allow low limbs to reduce vision.

c. Now, prune for appearance
   1) Prune watersprouts and suckers.

2) Prune branches going straight up or down.
3) Prune undesirable growth.
4) When two branches that are close together are growing parallel, the weaker branch should be removed.
5) Controlling the size of the tree is another reason to prune.

d. Topping trees **(TM 5.5)**
1) This is the removal of large quantities of growth at the ends of branches. This weakens trees and gives unnatural shapes.
2) Topping trees is not recommended for the long-term health of the tree.

e. Deciduous trees can be pruned during any season. Winter is generally preferred because you can see the tree structure better and you have less debris to haul off.

4. **Pruning deciduous shrubs**

a. Why should shrubs be pruned?
1) To improve form or growth
2) To stimulate or improve blooming
3) To maintain the health of the shrub
4) To control size of the shrub
5) Pruning can open the center of the shrub to light and better air flow.

b. Three shrub pruning techniques **(TM 5.6/HO 5.3)**
1) Thinning
(a) This is the removal of some branches from the ground or main stem.
(b) Start with dead, diseased, and damaged branches.
(c) Then remove crossing branches and any others to open up the shrub, including old branches.
2) Heading back
(a) Heading back is the selective pruning of branches back to main branches.
(b) Heading back can control the size of a shrub without changing its form.
3) Rejuvenation
(a) Rejuvenation pruning is a very drastic pruning technique.
(b) It requires cutting all of the branches off about 5" above ground level.
(c) This technique is done with old multi-stemmed shrubs to invigorate the plant.

c. When to prune
1) Deciduous flowering shrubs should be pruned after they bloom. If they bloom in the summer you may prune them in early spring.
2) Spring flowering deciduous shrubs are pruned after they bloom.
3) Summer flowering deciduous shrubs are pruned in late winter or early spring.

5. **Pruning evergreens**

a. Pruning pines **(TM 5.7)**
1) Their growth may be controlled by pruning the candles (the immature branches) back half to two-thirds of the candle in late spring.
2) Prune the pines to get a pyramidal form.
3) Pines are pruned in late spring.

b. Pruning junipers and arborvitaes **(TM 5.8)**
1) They may be pruned with pruning shears, leaving a more natural shape. They may also be pruned with hedge shears.
2) These plants have a dead zone in the middle of the plants. This area has lost foliage due to the inability for light to penetrate the middle of the plant. Do not cut into this area, because it will not grow new foliage.
3) Many junipers including pfitzers and other spreading junipers will keep their

natural growth habit if they are headed back rather than sheared.

4) Junipers, arborvitae, and yews should be pruned in early spring, but they can be pruned at any time.

6. **Pruning hedges**

a. Formal hedges **(TM 5.9)**

1) Formal hedges are sheared with hedge shears.

2) They may be rounded or flat on top. But the base should be wider than the top for good light infiltration to the leaves. The bottom foliage dies out if the top is wider than the bottom.

b. Informal hedges **(TM 5.9)**

1) These hedges are formed by planting shrubs close together and generally allowing them to keep their natural shape.

2) Very little pruning is needed. Older growth may be thinned out.

7. **Controlling pests on ornamental plants**

a. Resistant varieties - The easiest way to solve pest problems in ornamental plants is to avoid them in the first place. This can be done by selecting trees and shrubs that are resistant to insects or diseases

b. Diagnosing problems

1) The first thing to do is to determine what variety you are concerned about. After knowing what variety it is, estimate the size or age of the plant.

2) Next, take a visual analysis of the plant. Look closely at the leaves, twigs, and branches. If the leaves show damage, determine if the problem is holes, netting, or discoloration.

3) You also need to consider if any recent construction has been done around the plant. Look for mechanical damage (lawn mower damage), girdling, or chemical damage.

4) You may use books to help solve your problem or go to your county extension agent, or nursery person for assistance. If you consult an expert for help, take a fresh sample in a plastic bag for accurate identification.

c. Insects **(TM 5.10)**

1) Chewing insects

(a) Chewing insects will leave holes in leaves or a netted appearance on leaves.

(b) Most leaf chewing is done by caterpillars and leaf miners.

2) Sucking insects

(a) They suck on plant juices in leaves and stems.

(b) Examples of sucking insects are scale, aphids, mealybugs, and spider mites. Spider mites are actually not insects.

3) Boring insects

(a) Boring insects are difficult to see, but the marks of their presence are evident by holes in the bark.

(b) Boring insects frequently infest trees in poor health.

d. Diseases

1) Leaf diseases

(a) Look for unusual spots on leaves.

(b) Leaf spot and powdery mildew are two examples.

2) Stem diseases

(a) Dieback of leaves or growths on the stems are indications of stem disorders.

(b) Examples are galls, cankers, fire blight, crown galls, anthracnose, and

witches broom.

3) Root diseases
   (a) Root diseases are seen in the top of the tree. Usually by the time damage is seen, the disease has spread too far for control.
   (b) Root rot and verticillium wilt are two examples.

e. Cultural problems
   1) Mechanical damage
      (a) This could be damage from lawn mowers, children, or girdling from ropes, wires, or chains.
      (b) Damage from being run into by mowers can be reduced by using mulch around the tree.
   2) Weather damage - Some examples are frost crack on trunks, scorched leaves, and leaf and flower frost damage.
   3) Chemical damage
      (a) Salt and 2,4-D are common causes of chemical damage.
      (b) 2,4-D damage generally is caused by pesticide spraying drift.

f. Weeds in landscape beds
   1) Weeds should be eliminated because they compete with plants for fertilizer and water and are unsightly.
   2) Weeds may be reduced by the use of weed mats (landscape fabric), pre-emergence herbicides, or a combination of both. Pre-emergence herbicides prevent most weed seeds from germinating.
   3) Mulches will also aid in the reduction of weeds in landscape beds.

g. Types of pest control
   1) Mechanical control - Hand picking of pests, like bagworms, is one example of mechanical control. Pruning of seriously infected branches is also an example. Infected branches should be burned. Do not leave infected branches in wood piles.
   2) Biological control
      (a) This is the method of using natural compounds or predators to control pests.
      (b) The use of bacillus thuringiensis to kill caterpillars is an example.
      (c) Sterilization of males in a population also is effective.
   3) Chemical control
      (a) Insecticides kill insects.
      (b) Herbicides kill plants.
      (c) Fungicides kill diseases.
      (d) Miticides kill mites.

h. Pesticide safety
   1) Read the entire label and follow directions.
   2) It is unlawful to use a pesticide in any manner or for any purpose other than those specified on its label.
   3) Use rubber gloves, goggles, and a respirator, especially when mixing the chemicals. This is when they are most concentrated.
   4) Do not apply pesticides on a windy day.
   5) Wash face and hands before eating, drinking, or smoking.
   6) Only store pesticides in original containers and away from children's reach.

i. Pesticide application methods
   1) Sprays - They can come in a ready-to-use form, in a concentrated liquid, or in a wettable powder.
   2) Dusts - Dusts are spread thoroughly over the foliage and stem areas.
   3) Granules - They are sprinkled on the plant or on the ground.

8. **Fertilization**

a. What is in the bag?
   1) N-P-K
      (a) N = nitrogen which promotes green growth
      (b) P = phosphate/phosphorus which promotes a good root system and the improvement of flowering and fruiting
      (c) K = potassium/potash which encourages the general vigor of the plant and helps give disease resistance
   2) The fertilizer grade/analysis **(TM 5.11)**
      (a) The grade is the set of three numbers that goes along with the N-P-K.
      (b) If the grade is 5-10-10, it means the bag of fertilizer has 5% N, 10% P, and 10% K. These add up to 25%. The rest of the contents is usually inert matter and/or trace minerals.
      (c) Trace minerals should only be applied if a soil test gives the recommendation. Trace minerals are nutrients that the plant needs in minute amounts.

b. Types of fertilizers
   1) Organic - Organic fertilizers come from natural sources, such as manure, sewage sludge, or fish emulsion.
   2) Inorganic - Inorganic fertilizers come from rock or petroleum products.

c. Forms of fertilization application
   1) Granular - Granular applications may be spread over the soil surface, around a tree, or the granules may be poured in holes bored under the tree.
   2) Liquid - Liquid fertilizers may be injected into the soil under the tree by way of feeding needles.
   3) Foliar - Foliar is the process of spraying the fertilizer directly on the foliage. This is usually emergency help for severely undernourished plants.

d. Applying the fertilizer
   1) Determining the amount of fertilizer needed.
      (a) If the tree trunk is less than six inches in diameter, then use 1-2 pounds of 10-10-10 or 10-6-4 grade fertilizer per inch of diameter of the trunk.
      (b) If the tree trunk is six inches or more, use 2-4 pounds of 10-10-10 or 10-6-4 grade fertilizer per inch of diameter of the trunk.
      (c) Do not overuse fertilizers--too much fertilizer is harmful to the plant.
   2) Making the holes **(TM 5.12)**
      (a) Start two to four feet from the tree trunk and put holes every two feet around the tree until the fertilizer is two feet past the drip line. The holes should be two inches in diameter and 18 inches deep.
      (b) A deeding needle with a soluble solution may be used instead of auguring holes.

e. Time to fertilize
   1) The best time to fertilize is from mid-October to December. But early spring is also a satisfactory time to fertilize.
   2) After the first five years, trees only need fertilization every two to three years.

9. **Mulching landscape plants**

a. Benefits of mulch
   1) It conserves moisture.
   2) It helps to maintain a constant temperature.
   3) It helps reduce weed growth in landscape beds.
   4) It reduces mower damage to plants.
   5) It looks good in landscape beds.

b. Choices of mulch materials
   1) Bark, bark mulch, or wood chips
   2) Cocoa hulls
   3) Ornamental rock or gravel
   4) Pine needles
   5) Nonornamental mulches (e.g., straw and grass clippings)
c. Depth of mulch - Mulch should be at least two inches deep.
d. Remulching
   1) When using organic mulches such as bark mulch or cocoa hulls, they may need a top dressing every year.
   2) Rock mulch will only need replenishment when they have been washed or kicked out.

10. Watering

a. Watering is usually not needed after establishment of trees or shrubs unless there is a drought. If this is the case, soak all areas under the plant deeply and slowly every 3-4 weeks.
b. Light watering or inconsistent watering can cause more harm than good.
c. Landscape beds may be suited to sprinkler systems, which are set to water every two weeks during dry periods.

F. Group Discussion

G. Summary and Conclusions

1. Trees are pruned for their health and appearance. They are also pruned to eliminate safety hazards.
2. Shrubs can be pruned by thinning, heading back, and rejuvenation techniques.
3. Plants can be damaged by insects, diseases, and cultural problems.
4. Plants are fertilized to promote the following: green growth, fruiting and flowering, good root system, and general vigor of the plant.
5. Mulch helps conserve moisture, maintain constant temperatures, reduce weeds, and keep mowers away from the plants.
6. Watering is usually not needed on established trees and shrubs except during a drought.
7.
8.

H. Announcements and Social

I. Materials

1. Instructor

   a. Transparency Masters (TMs 5.1-5.12)

2. Student

   a. Handouts (HOs 5.1-5.3)

3. Supplementary Resources

   a. All About Pruning. San Francisco, CA: Ortho Books (Chevron Chemical Co.), 1979.

b. Haller, John M. Tree Care. Indianapolis, IN: Howard W. Sams & Company Publishers, 1977.

c. Pirone, P.P. Tree Maintenance. 5th ed. New York, NY: Oxford University Press, 1987.

d. University Extension: University of Missouri-Columbia

1) #6880 Understanding Tree and Shrub Problems
2) #6881 Leaf Scorch of Ornamental Trees and Shrubs
3) #7356 Elm Leaf Beetle
4) #7865 Anthracnose of Shade Trees
5) #7870 Cedar-Apple Rust
6) #7880 Crown Gall Disease of Nursery Stock

e. USDA and EPA, Applying Pesticides Correctly, A Guide for Private and Commercial Applicators. North Carolina State University in cooperation with Extension Services and the United States Department of Agriculture, 1988. (Available from the Instructional Materials Laboratory, University of Missouri-Columbia, 8 London Hall, Columbia, MO 65211.)

4. Supplementary Activities

a. View one of the following videos available from the Missouri Vocational Resource Center, University of Missouri-Columbia, 8 London Hall, Columbia, MO 65211.

1) Elements of Pruning. Vocational Education Productions, 1987. 15 min.
2) Poulan Chain Saw Safety. Poulan. 12 min.

b. Select a tree or shrub on the school grounds, on public property, or at a student's home. After permission is obtained, demonstrate pruning techniques. Then, have students practice pruning. Pruning shears, lopping shears, a pruning saw, hedge shears, or a pole pruner will be needed for pruning. Safety procedures should be followed at all times.

c. Select a tree or shrub on the school grounds, on public property, or at a student's home. After permission is obtained, have students practice fertilization procedures. A supplies and equipment list is given for application of granular and soluble fertilizers.

GRANULAR
--Granular fertilizer
--Punch bar (large pry bar) or a auger to make 2" diameter holes
--Tape measure
--Water hose

SOLUBLE
--Soluble fertilizer
--Feeding needle
--Tape measure
--Water hose

d. Select several trees and shrubs on the school grounds, on public property, or at a student's home. After permission is obtained, have students identify pests problems. A pruning shears, plastic bags (for samples), and a book on plant pests may be needed.

Pruning Small Branches

Strong Crotch

Weak Crotch

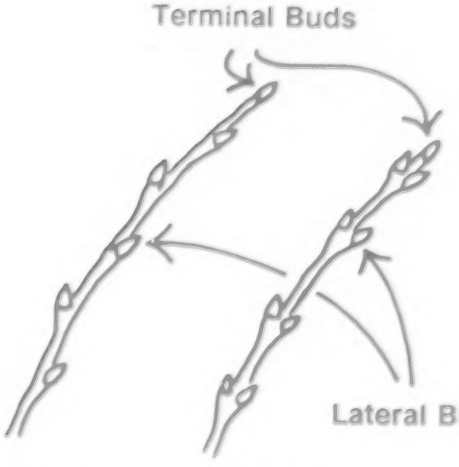
too much above the bud

too close to the bud

too flat

too slanted

correct



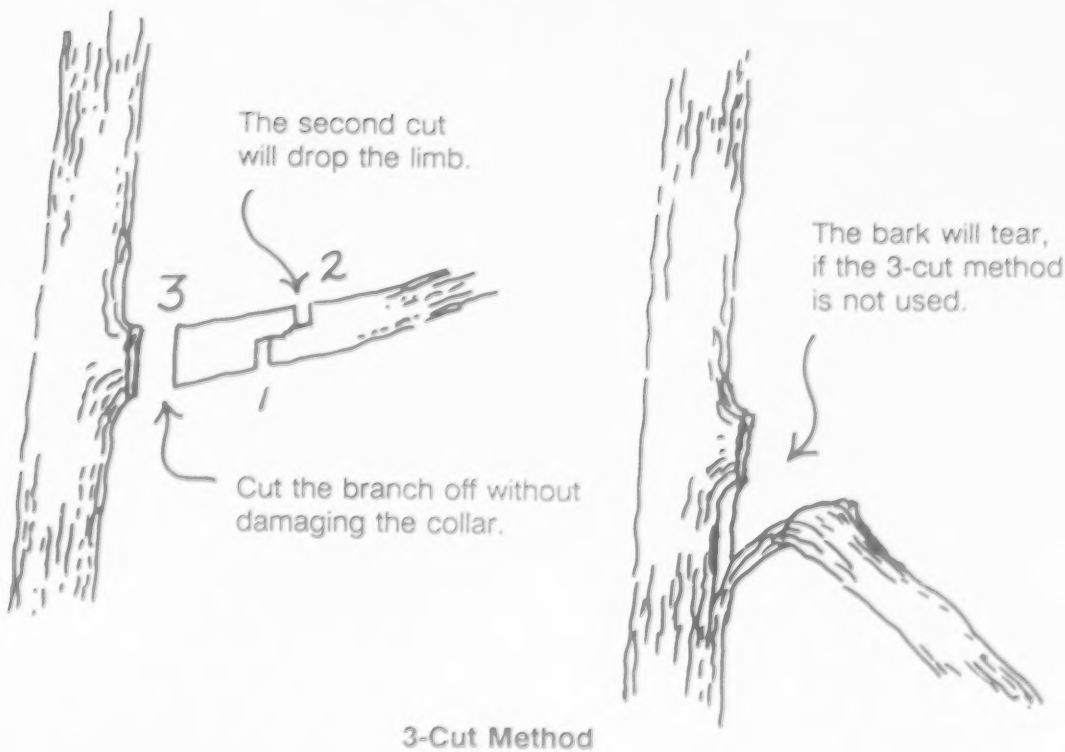
Alternate

Opposite

Removal of Terminal Growth

Pruning Larger Branches

Cutting to a Main Branch

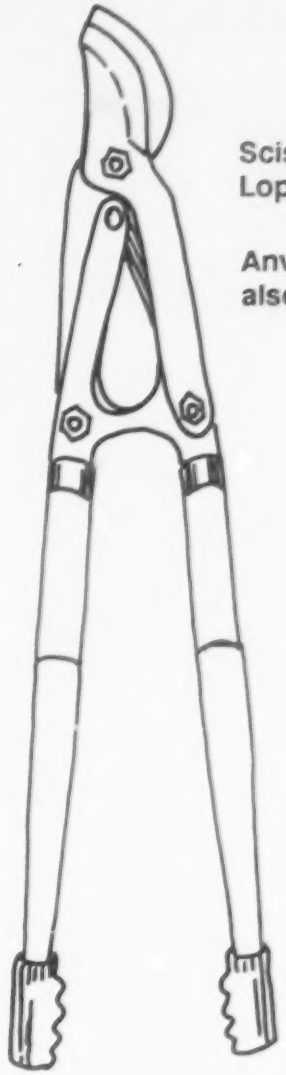


3-Cut Method

Pruning Tools

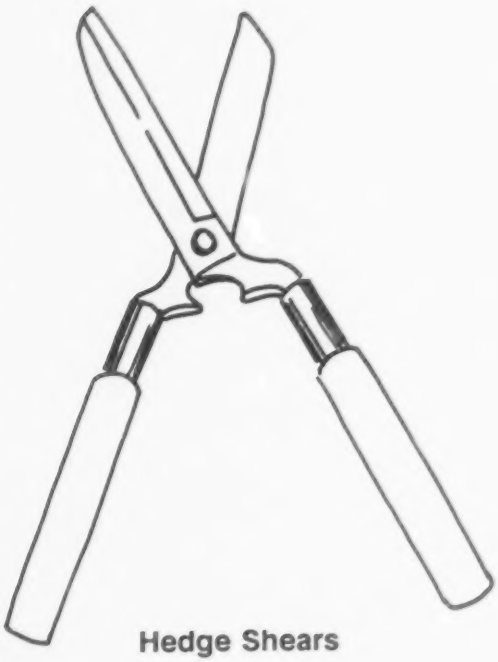
Scissors-Type
Pruning Shears

Anvil-Type
Pruning Shears

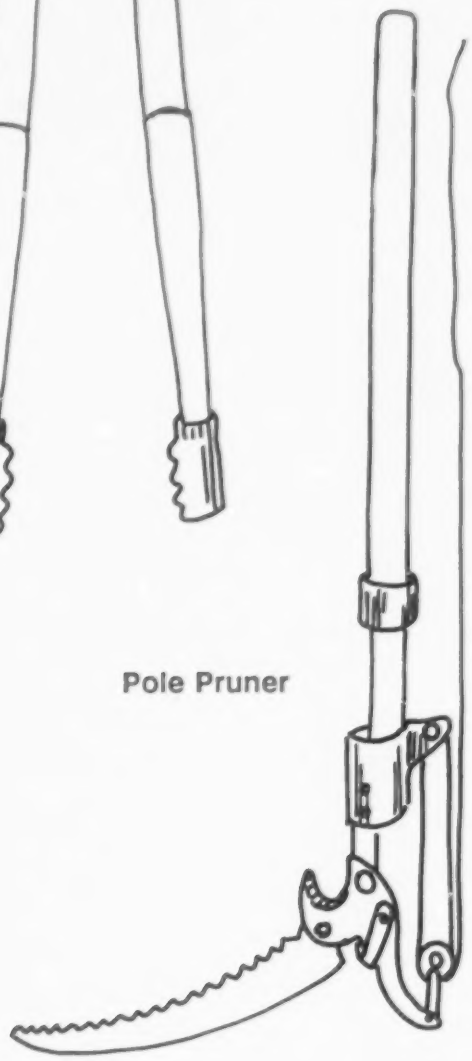


Scissors-Type
Lopping Shears

Anvil-type are
also available.

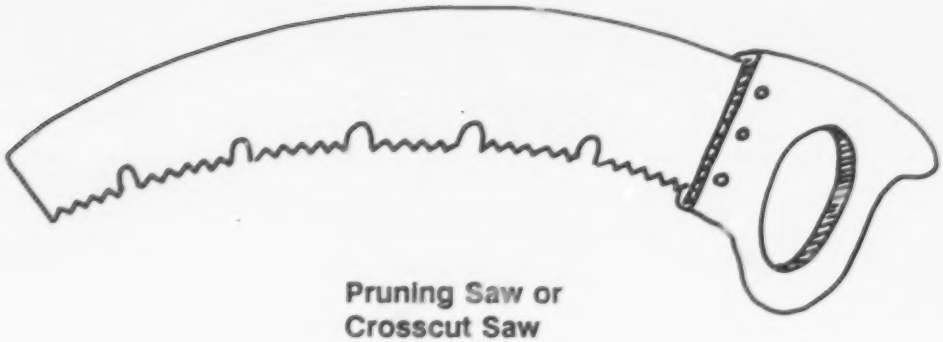


Hedge Shears

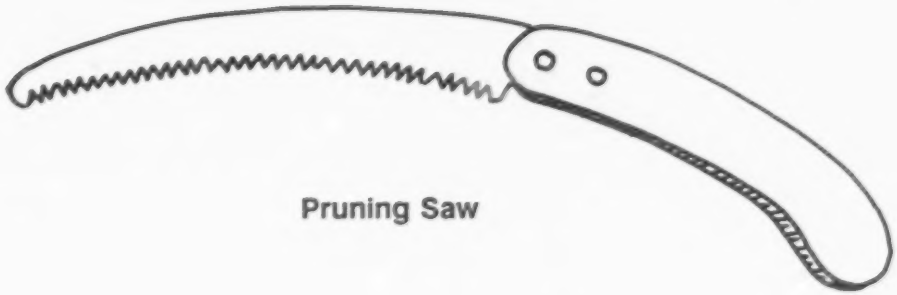


Pole Pruner

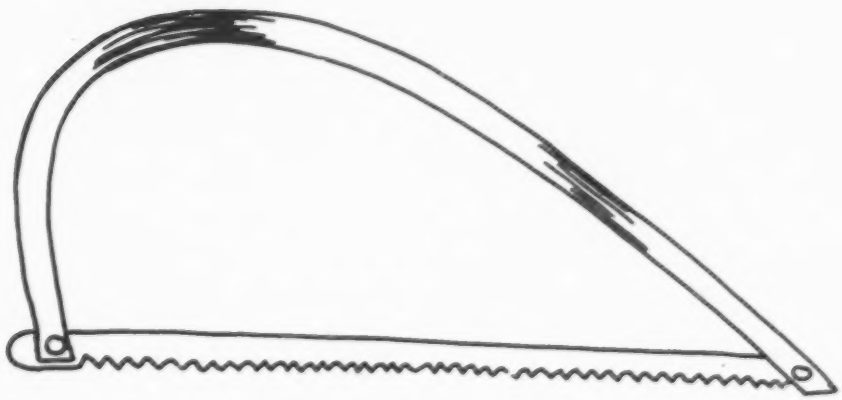
Pruning Tools (continued)



Pruning Saw or
Crosscut Saw



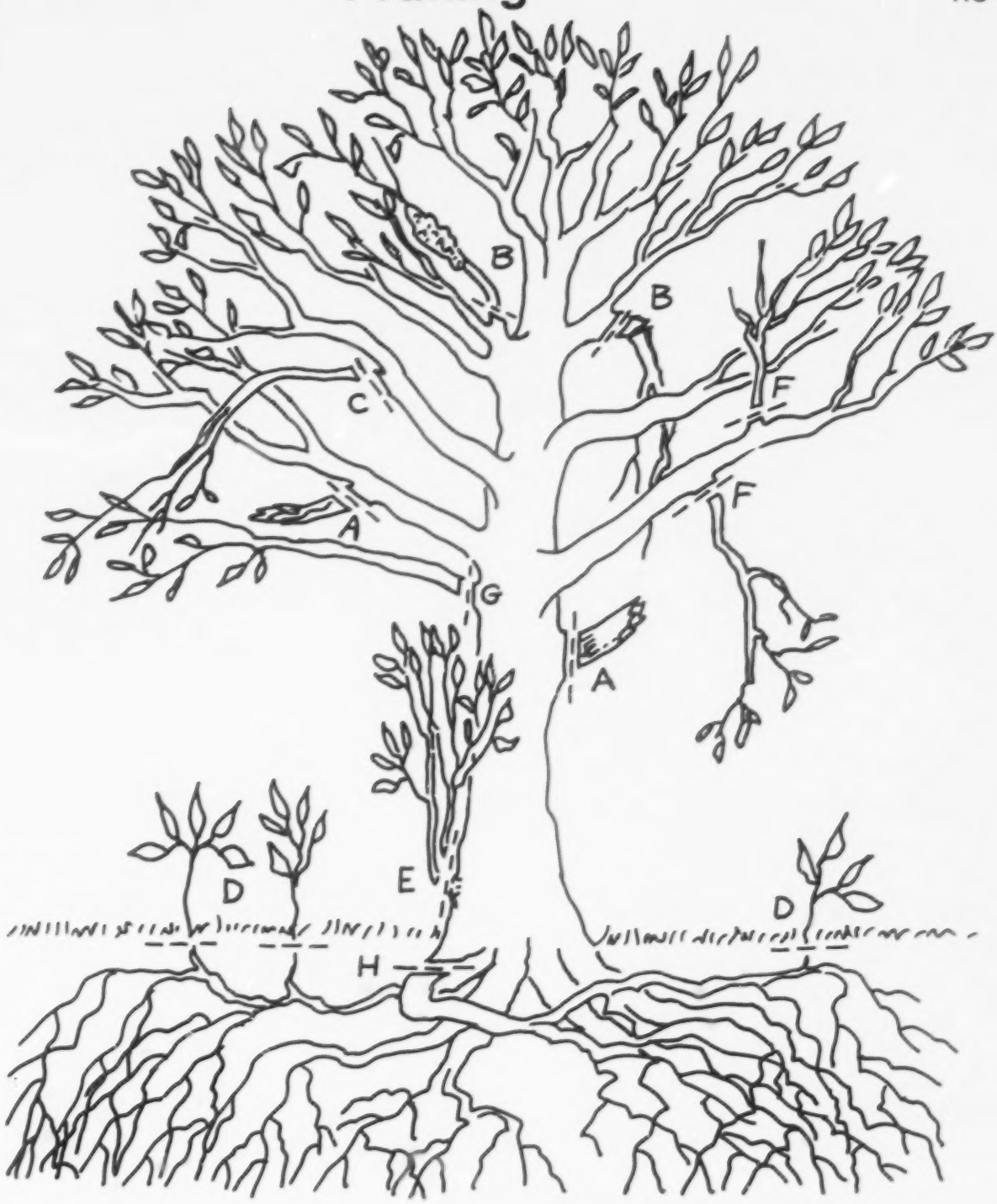
Pruning Saw



Bow or Camp Saw

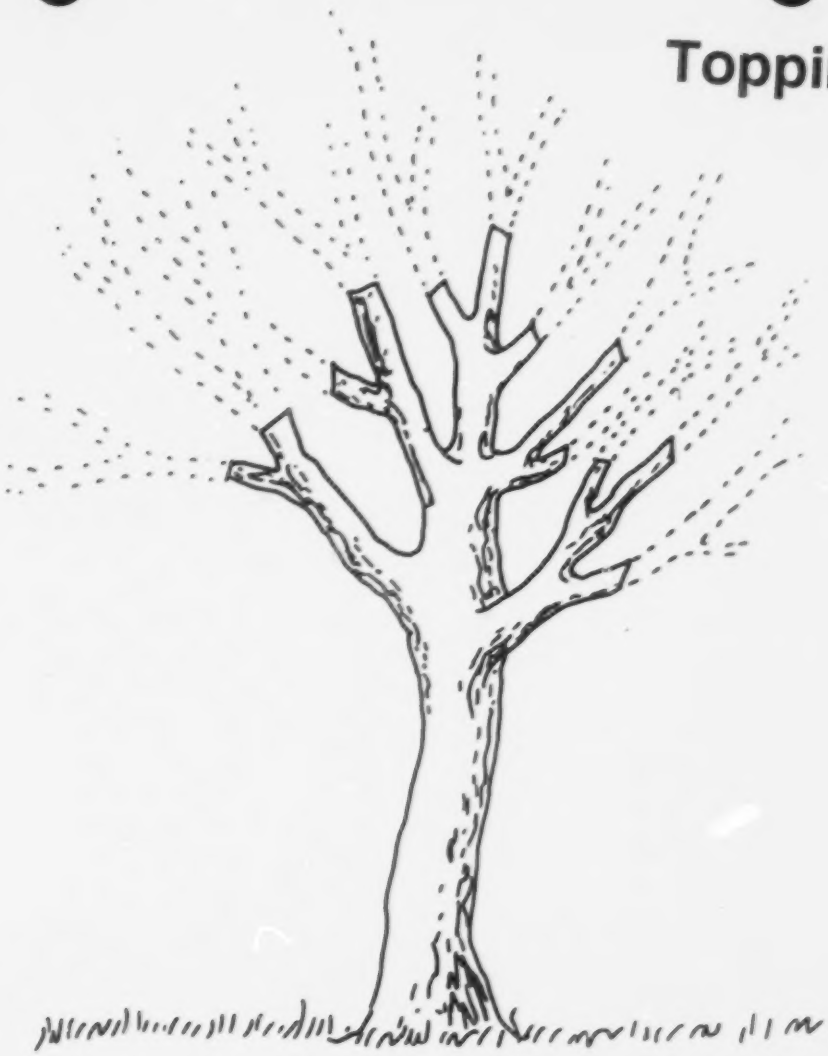
Pruning

TM 5.4
HO 5.2



A - Stubs
B - Broken, Dead, and Diseased
C - Crossing Branches
D - Suckers
E - Water Sprouts
F - Branches Going Straight Up or Down
G - Close Parallel Branches
H - Girdling Roots

Topping

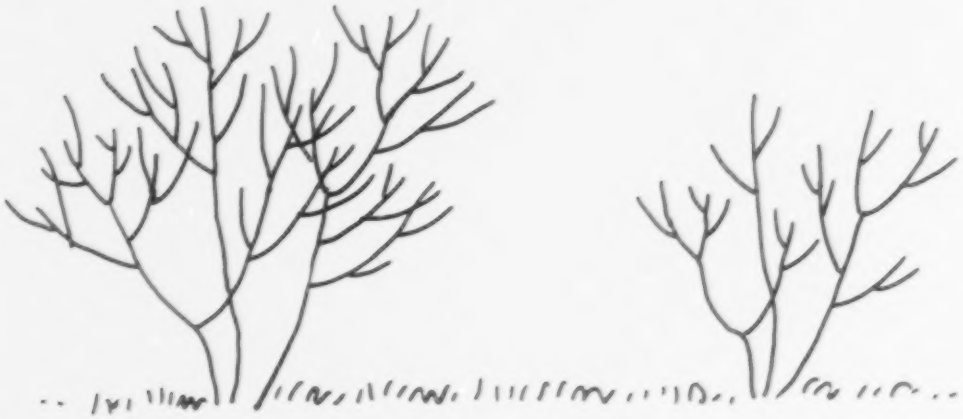


Topping

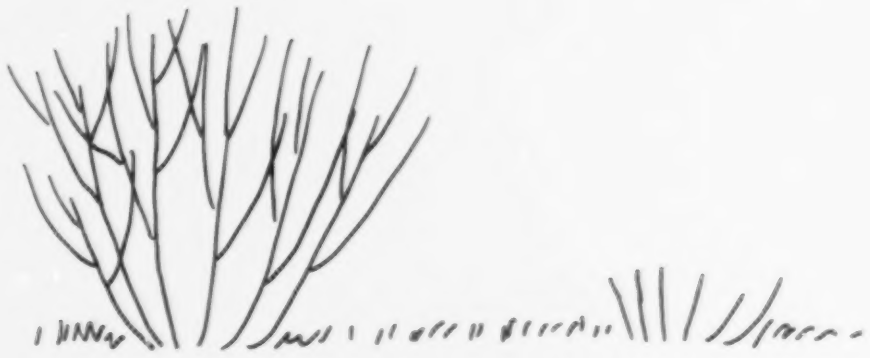
Growth After Topping

Pruning Deciduous Shrubs

Thinning

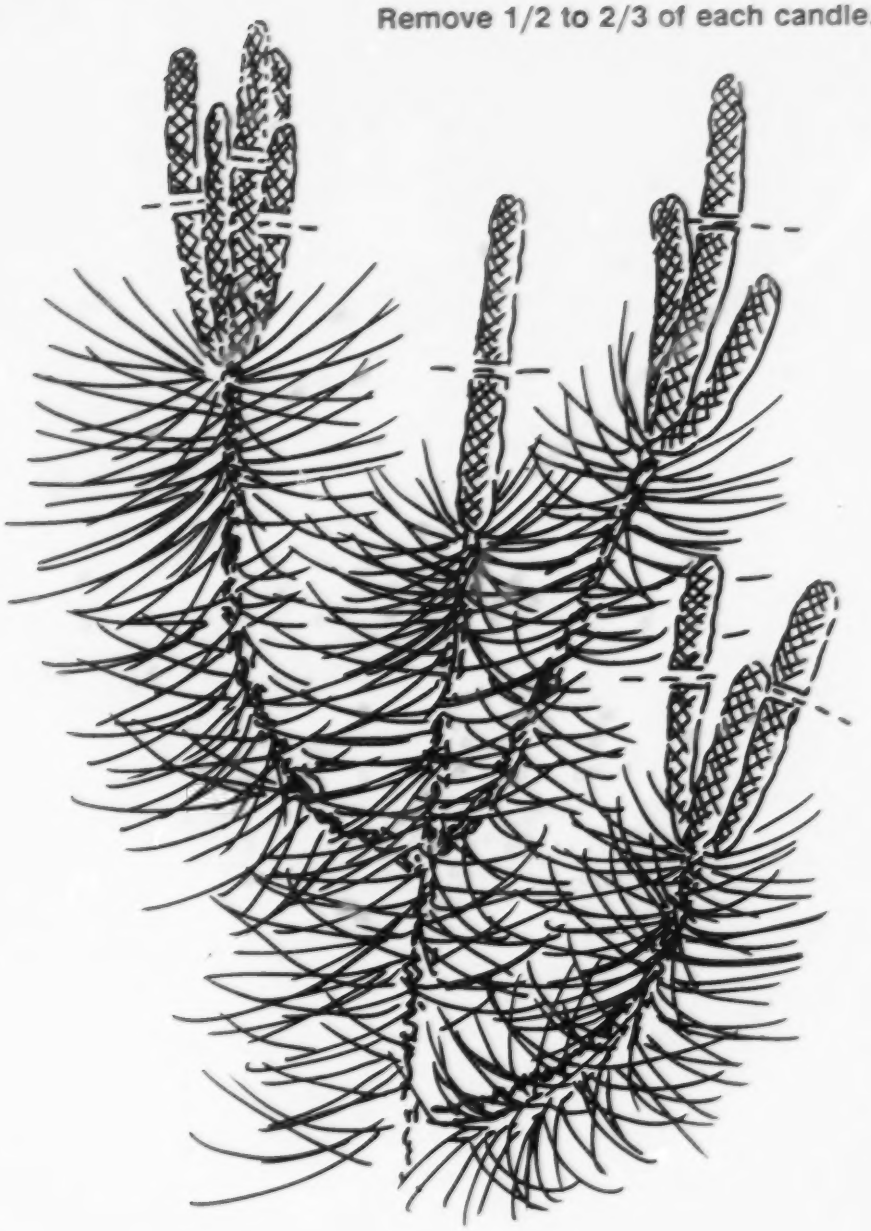


Heading Back

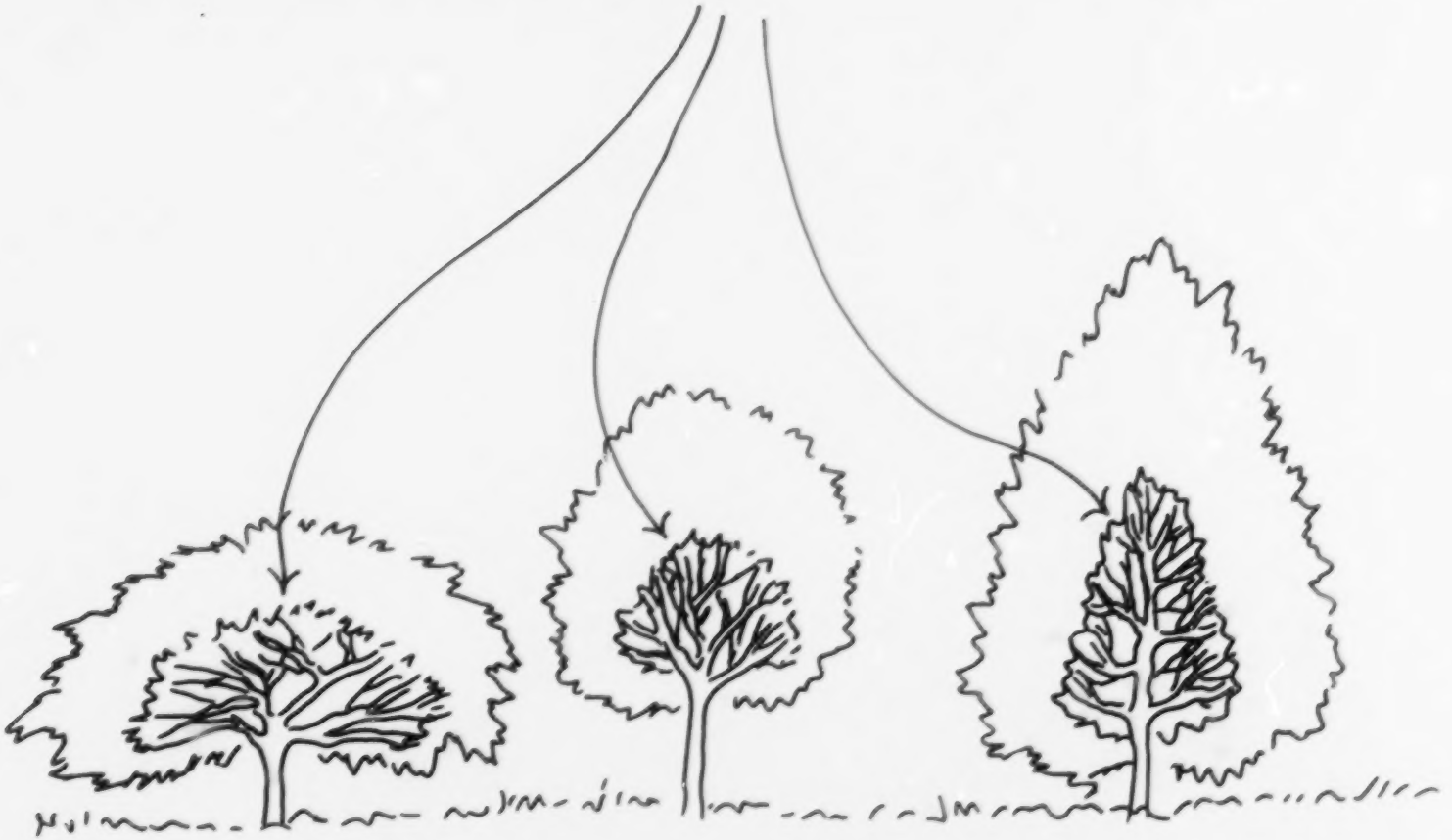


Rejuvenation

Pruning Candles on Pines



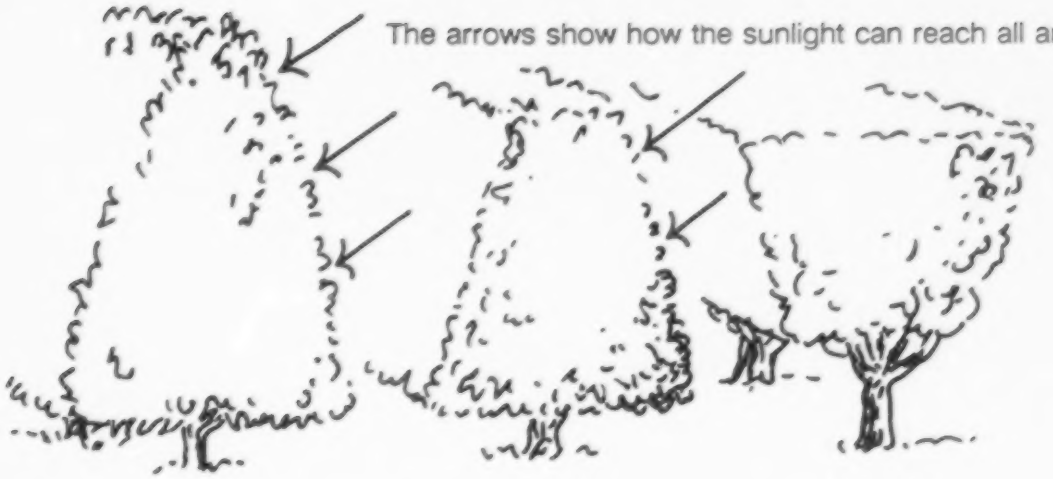
Deadzones in Arborvitae and Junipers



Pruning Hedges

Formal Hedges

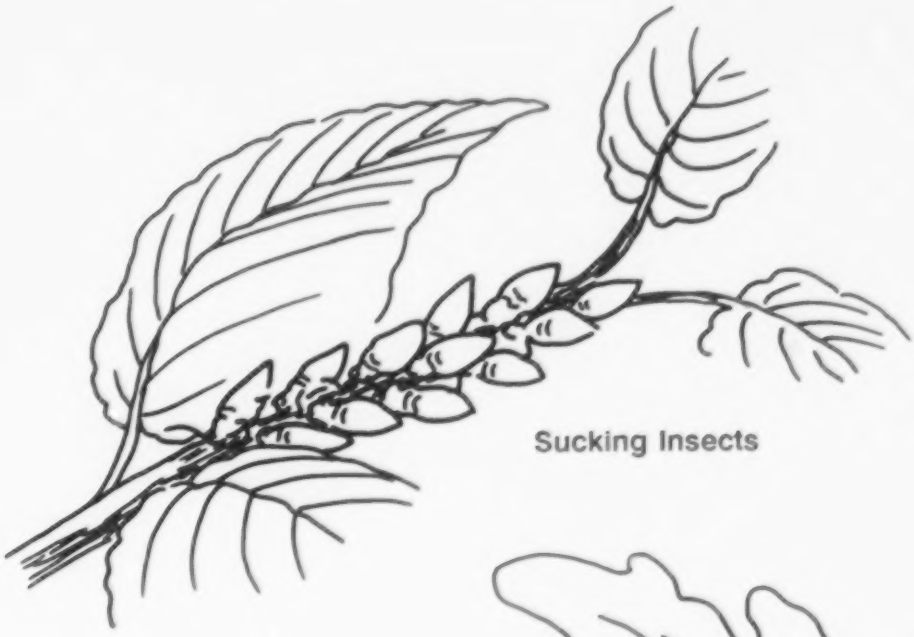
The arrows show how the sunlight can reach all areas.



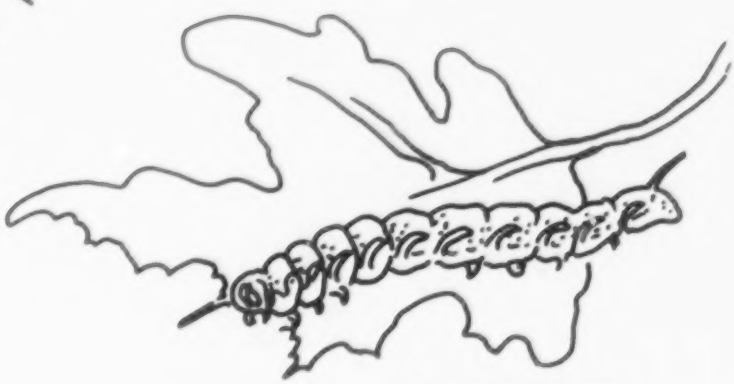
correct correct incorrect

Informal Hedges

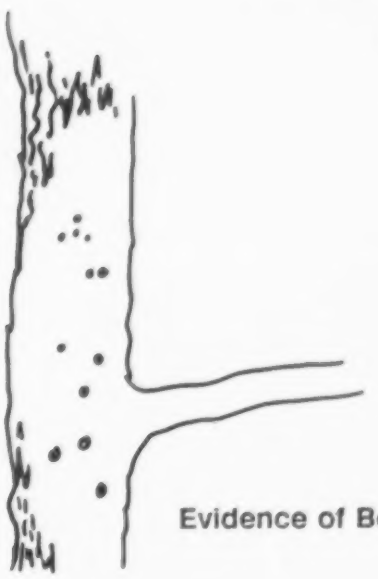
Location of Plant Insects



Sucking Insects



Chewing Insects

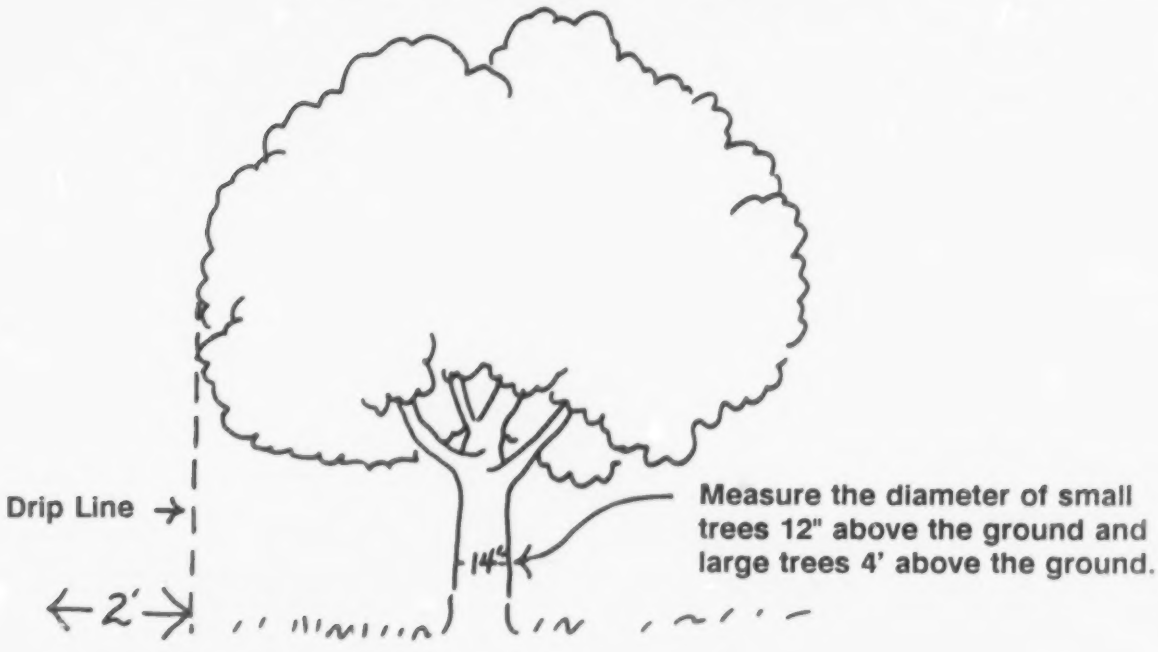


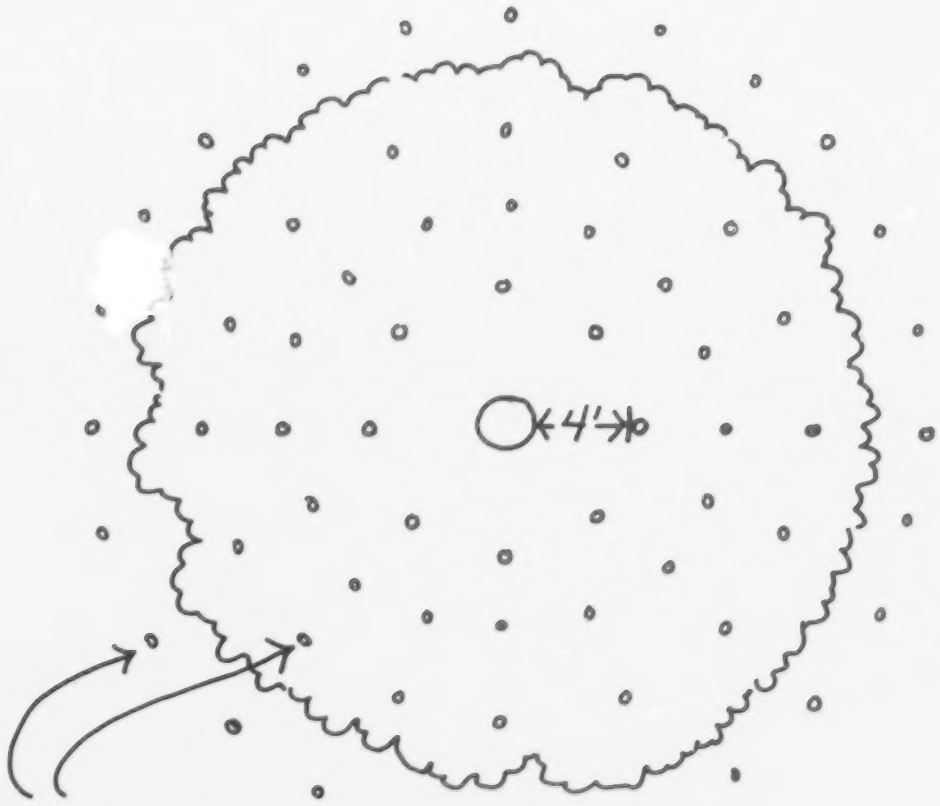
Evidence of Boring Insects

Fertilizer Bag

5% (N) Nitrogen - 2 1/2 lbs in a 50 lb bag
10% (P) Phosphorus - 5 lbs in a 50 lb bag
10% (K) Potassium - 5 lbs in a 50 lb bag

Fertilizing a Tree





Places to Deposit Fertilizer

Lesson 5: Landscape Maintenance

OUTLINE

1. Pruning basics
   a. Pruning small branches
   b. Pruning large branches
   c. Pruning safety
2. Pruning tools
   a. Pruning shears
   b. Lopping shears
   c. Hedge shears
   d. Pruning saws
   e. Pole pruner/saw
   f. Tool maintenance
3. Pruning deciduous trees
   a. Prune for trees health
   b. Prune for safety
   c. Prune for appearance
   d. Topping trees
   e. Pruning time
4. Pruning deciduous shrubs
   a. Why prune shrubs?
   b. Shrub pruning techniques
      1) Thinning
      2) Heading back
      3) Rejuvenation
   c. When to prune

5. Pruning evergreens
    a. Pruning pines
    b. Pruning junipers and arborvitaes
6. Pruning hedges
    a. Formal hedges
    b. Informal hedges
7. Controlling pests on ornamental plants
    a. Resistant varieties
    b. Diagnosing problems
    c. Insects
        1) Chewing insects
        2) Sucking insects
        3) Boring insects
    d. Diseases
        1) Leaf diseases
        2) Stem diseases
        3) Root diseases
    e. Cultural problems
        1) Mechanical damage
        2) Weather damage
        3) Chemical damage
    f. Weeds in landscape beds
    g. Types of pest control
        1) Mechanical control
        2) Biological control
        3) Chemical control
    h. Pesticide safety

111

i. Pesticide application methods

8. Fertilizing trees and shrubs

   a. What is in the bag?

      1) N-P-K

      2) Fertilizer grade/analysis

   b. Types of fertilizer

   c. Forms of fertilization application

      1) Granular

      2) Liquid

      3) Foliar

   d. Applying the fertilizer

      1) Determining the amount of fertilizer

      2) Making the holes

   e. Time to fertilize

9. Mulching landscape plants

   a. Benefits of mulch

   b. Choices of mulch materials

   c. Depth of mulch

   d. Remulching

10. Watering

UNIT - INTRODUCTION TO LANDSCAPING

Lesson 6: Lawn Care

A. Review

1. Why are trees pruned?
2. Why are trees and shrubs fertilized?
3. How does mulch help landscape plants?
4. How often are established trees watered?
5.
6.

B. Objectives

The student will be able to:

1. Explain some of the characteristics of the different lawn grasses.
2. Explain the steps needed to establish a lawn by seed or sod.
3. Explain what lawn renovation is.
4. Set up a watering schedule.
5. Explain the benefits of lawn fertilization.

C. Motivation

1. Show slides of lush green lawns and lawns with bad weed problems. Ask the class which lawn would they prefer in their yards.
2. Bring in some common lawn weeds and ask if anyone has any of these weeds in his or her lawn.
3. Bring in some examples of lawn equipment such as: soil aerator, power rake, and sprinklers.
4. Compare several different lawns (possible the students and their neighbors). Which lawns are the greenest? Which lawns appear to be healthy? Fertilizer, at an average cost of $2 per 1000 square feet or just $20 for an average home lawn, can greatly improve the quality of the lawn.

D. Key Points

1. Turf varieties
2. Lawn establishment
3. Lawn renovation
4. Mowing your lawn
5. Aeration and thatch removal
6. Watering
7. Fertilization
8. Turf pests

E. Introduction of Information **(Distribute HO 6.1, outline.)**

1. Turf varieties

a. Things to consider when selecting a grass variety for your lawn
   1) What kind of weather conditions do you have?
      (a) Temperature extremes
         (1) Tall fescue will withstand extreme heat better than bluegrass.

(2) Zoysia grass and Bermuda grass will tolerate the extreme heat, but will not tolerate the cold extremes North of I-70 as well as the cool-season grasses.

(a) Moisture

(1) Tall fescue will tolerate a drought better than bluegrass or ryegrass.

(2) Zoysia grass and Bermuda grass can tolerate a drought better than the cool-season grasses.

(c) Shade - Turf-type tall fescue and creeping red fescue are the best grasses for the shade.

2) Level of maintenance

(a) Kentucky bluegrass has one of the highest levels of maintenance. This includes mowing, watering, aeration, thatch removal, pest control, and fertilization.

(b) Zoysia grass and Bermuda grass will tolerate lower maintenance requirements, but can become weeds in flower beds and shrub borders.

(c) Tall fescue can withstand less maintenance.

3) What quality of lawn is desired?

(a) Warm-season grasses do not turn green until May, while cool-season grasses turn green in March.

(b) The improved bluegrass varieties can give excellent turf quality

(c) The new turf-type tall fescues provide good quality if seeded at 10-12 lbs. per acre.

(d) K-31 tall fescue has a coarse blade and provides a decent lawn where low maintenance is desired.

(e) Blends may also be used. Blends may be several varieties of one type of grass or several types of grass blended together.

b. Turf variety characteristics **(HO 6.2)**

1) Cool-season grasses grow best in cooler regions. They turn green in early spring and hold their green color into the fall, but they may go dormant during hot summer months unless they are watered.

2) Warm-season grasses are better adapted to the area south of I-70, in the warmer parts of the state. They turn green in May and will go dormant in early fall.

2. Home lawn establishment

a. Seeding

1) Seed bed preparation

(a) Grading is the first consideration. Hopefully the topsoil was piled separately so it could be used in the final grading.

(b) You should have four to six inches of topsoil graded slowly away from the house.

(c) Take a soil test to your extension service to determine lime, potassium, phosphorous, or organic matter requirements.

(d) Add required amendments (based on soil test analysis) and till the soil four to six inches deep to incorporate them.

(e) The final step is to hand-rake the lawn. Any uneven spots you leave now will be hard to correct after grass is growing.

2) Select the right grass variety for you. It can be difficult to change at a later date.

3) Sowing the seed

(a) Seeding rates

(1) Bluegrass - 2-3 lbs/1,000 sq ft

(2) Ryegrass - 5-6 lbs/1,000 sq ft

(3) K-31 Tall Fescue - 6-8 lbs/1,000 sq ft

(4) Turf-Type Tall Fescue - 10-12 lbs/1,000 sq ft

(5) Red Fescue - 3-6 lbs/1,000 sq ft
(6) Bermuda Grass - 2-3 lbs/1,000 sq ft

(b) Sow the seed with a drop-type or broadcast spreader. Apply at 1/2 the rate back and forth. Then apply the other half of the seed perpendicular to the first half. **(TMs 6.1 and 6.2)**

(c) Lightly rake over the seed. Try not to move the seed around. The seed should be 1/4 inch deep.

4) Mulching - Use one bale of straw per 1,000 square feet to conserve moisture.

5) Watering

(a) Grass seed must be kept moist until the grass starts to grow. This may mean watering 2 to 3 times a day.

(b) When the grass has started growing the watering frequency may be slowed.

6) First mowing - When the grass reaches three inches, mow it back to two inches.

7) Weed control - Since new grass is sensitive to most herbicides, care should be taken when they are applied.

b. Sodding

1) Seed bed preparation - (Same as for seeding)

2) Variety selection

(a) Buy quality sod; do not buy a sod grower's problem.

(b) Before buying, roll a couple of rolls out and check for weeds or thin sod. Do not purchase if problems are seen.

3) Ordering sod

(a) Sod is generally sold in square yards (1 sq yd = 9 sq ft)

(b) Measure your lawn and order 5 to 10 percent extra. It is sometimes difficult to match sod bought at different times, so order plenty.

(c) Make sure it is fresh sod.

(d) Have it delivered the day you plan to use it.

4) Sod installation **(TM 6.3)**

(a) Start laying sod next to a long straight line. Lay the next row along side of the first row. Make sure the seams of the first row don't line up with the seams in the second row, etc.

(b) Make sure all places where the sod meets are pulled tightly together. Do not leave spaces or overlap pieces.

(c) Use a large knife or sharp shovel to cut the sod.

(d) Roll the sod with a lawn roller.

5) Watering - Water the sod every day or every other day for the first two weeks, depending on weather conditions.

6) First mowing - Mowing will generally be needed in one week. Mow the grass back to two inches.

3. Lawn renovation (overseeding)

a. Why renovate your lawn?

1) Overseed to help fill-in a thin yard. If the lawn is down to 50 percent, it would be advisable to overseed.

2) You would also overseed to change grass types.

b. Why did the lawn decline?

1) Soil problem

(a) Compaction

(b) pH or fertility

2) Maintenance problem

3) Pest problem

(a) Weed

(b) Insect
(c) Disease

c. Preparing the seed bed
1) Apply herbicide to rid the lawn of weed problems before planting. Read the herbicide label to determine the waiting time before reseeding.
2) The grass should be mowed to a height of 1 1/2 inches and bagged.
3) Use a verticut or core aerator to open the soil.

d. Seeding - Seed at 1/2 the normal rates. If the lawn is thinner than 50 percent, more seed could be seeded. A grass drill would give best seeding results.

e. Watering - Keep the seed moist until it starts to grow.

4. Mowing your lawn

a. Proper frequency and height
1) Only 1/3 of the grass blade should be removed at a time.
2) Mowing height

	Spring/Fall	Summer
Bluegrass	1 1/2 - 2"	2 1/2 - 3"
Tall fescue	2 - 2 1/2"	3 - 3 1/2"
Ryegrass	2"	3"
Bermuda grass	1 - 1/2"	1 - 1 1/2"
Zoysia grass	1 - 1/2"	1 - 1/2"

3) If mowing is done on a regular basis, clipping removal is not needed; but do not allow piles of grass to smother the lawn.

b. Lawn mowers
1) Keep the mower blade sharp. Dull blades bruise the grass.
2) Rotary mowers
(a) Cheaper to buy
(b) Good for cool-season lawns
3) Reel mowers - Good for warm-season lawns and golf greens

5. Aeration and thatch removal

a. Well-aerated lawns will not have thatch problems. (Thatch is a build-up of dead plants, stems, and clippings.)

b. Aerators used on home lawns are generally core aerators (plug four inches long by 1/2 inch in diameter) or verticuts, which slice the soil. Both tools are made to improve the ability of the soil to take up water and oxygen.

c. Dethatching should be done when the thatch level reaches 1/2 inch thick.

d. Both aerators or dethatchers can be rented.

6. Watering

a. Frequency
1) The need for watering is dependent on the amount of rain received, the soil type, and the type of grass in the lawn.
2) In the spring and fall, lawns usually do not need watering unless it is uncommonly dry.
3) During the summer months, watering may be done once or twice a week, depending on the conditions.
4) Watering the lawn often (every one or two days) and with insufficient amounts is damaging to the lawn. It creates very shallow root systems, creates thatch, and promotes weed problems. Shallow root systems dry out faster and will be less

able to withstand drought.

5) Warm-season grasses will need very little water.
6) During dry winters, watering may be needed every three to four weeks.
7) Sandy soils will require more water than loam or clay soils.

b. Amount of watering
1) Turf should receive one inch of water per week, on the average. This will penetrate the soil six to eight inches deep.
2) Water the lawn at a slow rate so that the water will not run-off.

c. Time of day to water - The best time to water turf is in the early morning. If you water in the evening, the water stays on the grass all night creating a good environment for disease.

d. Watering systems **(TMs 6.4, 6.5, and 6.6)**
1) Soaker hoses
(a) A soaker hose has holes running down the hose at even intervals that spray water to both sides.
(b) These work well along narrow lawn sections like those between the sidewalk and road.
2) Sprinklers
(a) These are less expensive than underground sprinkler systems but are less efficient than underground sprinkler systems.
(b) Oscillating sprinklers spray in a rectangular pattern.
(c) Spray heads can spray in circular patterns.
(d) Impulse heads can spray large areas in circular patterns or major parts of circular patterns.
(e) Rotary heads
(1) Stationary types spray in circular patterns.
(2) The traveling type follows any shape that a hose can make. A traveling sprinkler most efficiently waters a lawn.
3) Underground sprinkler systems **(TM 6.6)**
(a) Advantages of underground sprinkler systems
(1) They can be programmed to water at any time. Therefore, the sprinkler can be programmed to water during the early morning (5:00-6:00 a.m.) when the water pressure is better and there is less wind drift.
(2) They use less water.
(3) They eliminate the need to drag around a hose and sprinkler.
(4) They have the capability to create a better lawn.
(b) Spray heads work well for the best uniform coverage and in tight areas.
(c) Impulse heads can cover large areas. They are frequently used in back yards.

7. **Fertilization**

a. Benefits of fertilization
1) A healthy lawn can withstand drought better than a poorly maintained lawn.
2) A healthy lawn resists diseases, insects, and weeds.
3) A good fertilization program will be the first step towards a lush green lawn. Proper mowing, watering, and pest control are also integral segments of a lawn care program.

b. What nutrients do lawns need?
1) A soil test would be beneficial in determining nutrient requirements.
2) There are three major elements that are applied on a regular basis. They are nitrogen (N), phosphorus (P), and potassium (K), indicated as N-P-K on the label.
(a) Nitrogen is responsible for the green growth of plants. Care should be

taken during the summer to avoid overstimulating the turf, causing stress on the plants.

(b) Phosphorus promotes strong root systems. This is an important element in fall applications.

(c) Potassium helps the general vigor of the plant.

(d) Do not apply trace minerals unless a soil test indicates that they are needed.

3) Fertilizer analysis to be used

(a) Use a balanced fertilizer in the fall such as 10-20-10 to promote a good root system.

(b) Use a higher nitrogen fertilizer in the spring, such as 20-4-8.

(c) Do not apply more than 1 pound of nitrogen per 1,000 square feet at any one time.

c. Fertilizing cool-season lawns

1) If you are going to fertilize only one time a year, do it in September.

2) If only two times, do it in September and November.

3) If three times a year, do it in September, November, and May.

d. Fertilizing warm-season lawns - Warm-season grasses are fertilized in late spring and summer.

e. Fertilizer application

1) Granular - Use a drop-type broadcast spreader to apply granular fertilizers. Apply at 1/2 the rate back and forth. Then apply the other half of the fertilizer perpendicular to the 1st half. **(TM 6.2)**

2) Liquid - Liquid fertilizers can be applied using a hose-end sprayer.

f. Lime application - The soil test analysis may indicate the need for the addition of lime. Lime reduces the acidity of soil.

8. **Turf pests**

a. Weeds

1) The term "weed" can identify any plant that is out of place. This would include fescue in a bluegrass lawn or bluegrass in a bentgrass golf green.

2) A thick, healthy stand of grass is the best weed prevention program. Weeds invade where there is space to grow.

3) A good maintenance program including proper fertilization, mowing, and watering can reduce the weeds in the lawn.

4) Annual weeds such as crabgrass, foxtail, and chickweed grow for only one season and die. These weeds can be controlled by pre-emergence herbicides that prevent the seeds from germinating.

5) Perennial weeds such as clover, dandelion, and purslane live for several years. These weeds can be controlled by post-emergence herbicides applied during active growth.

6) For identification, take whole fresh samples in a plastic bag to your extension agent, nursery owner, or a lawn specialist.

b. Turf insects

1) Turf insects and insect-like pests can quickly cause extensive damage to a lawn. Most insect pests are seldom seen because they live in the soil or thatch layer.

2) Due to insects' ability to cause damage rapidly; time must not be wasted in determining what is causing the damage. County extension agents or lawn care companies can be called to help evaluate the damage.

3) Most lawn pests can be controlled with some of the new granular insecticides.

c. Turf diseases

1) Most turf diseases are caused by fungi and can be spread by wind, water, or mechanical methods.

2) Turf varieties should be selected for their adaptability to the conditions and their natural resistance to diseases.
3) High maintenance lawns are very susceptible to disease and may require regular preventive fungicide treatments.
4) Watering lawns in the evening can encourage disease, because the grass may stay wet all night. Morning waterings will dry quicker.
5) County extension agents or lawn care companies can be called to evaluate the problem. Don't delay calling, because turf diseases can rapidly damage the lawn.

F. Group Discussion

G. Summary and Conclusions

1. Warm-season grasses grow best in the warm weather and in the southern half of the state.
2. Cool-season grasses grow best in the spring and fall.
3. If lawns are fertilized only one or two times, the applications should be done in the fall.
4.
5.

H. Announcements and Social

I. Materials

1. Instructor

a. Transparency Masters (TMs 6.1-6.6)

2. Student

a. Handouts (HOs 6.1 and 6.2)

3. Supplementary Resources

a. Beard, James B. Turfgrass: Science and Culture. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1973.

b. Emmons, Robert D. Turfgrass Science and Management. Albany, NY: Delmar Publishers, 1984.

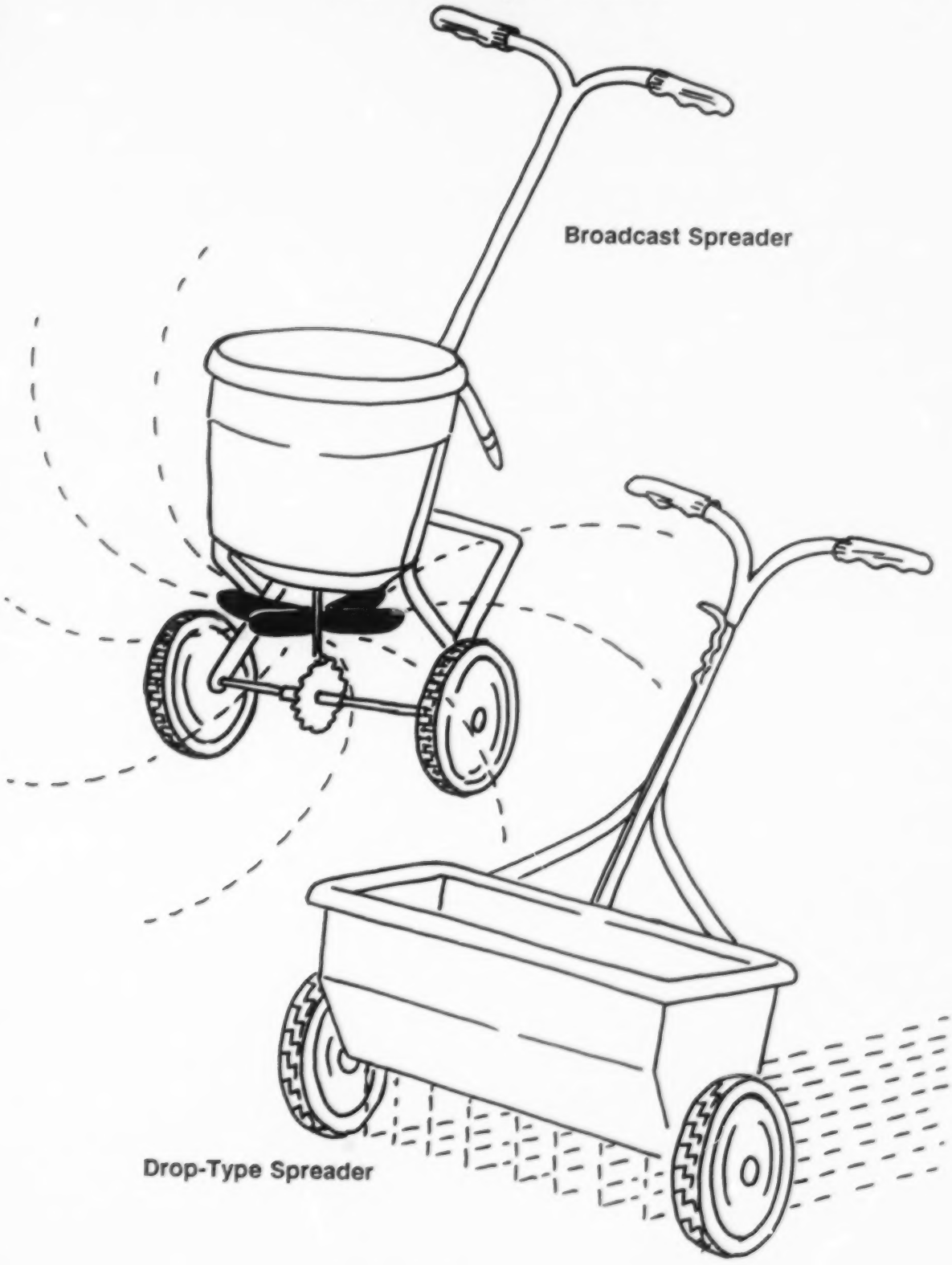
c. University Extension: University of Missouri-Columbia
1) #6700 Bluegrass and Fescue Lawns - Establishment
2) #6705 Bluegrass and Fescue Lawns - Maintenance Calendar
3) #6706 Establishment and Care of Zoysia
4) #6708 Thatch - Enemy of Lawns
5) #6750 Lawn and Turf Weed Control

4. Supplementary Activities

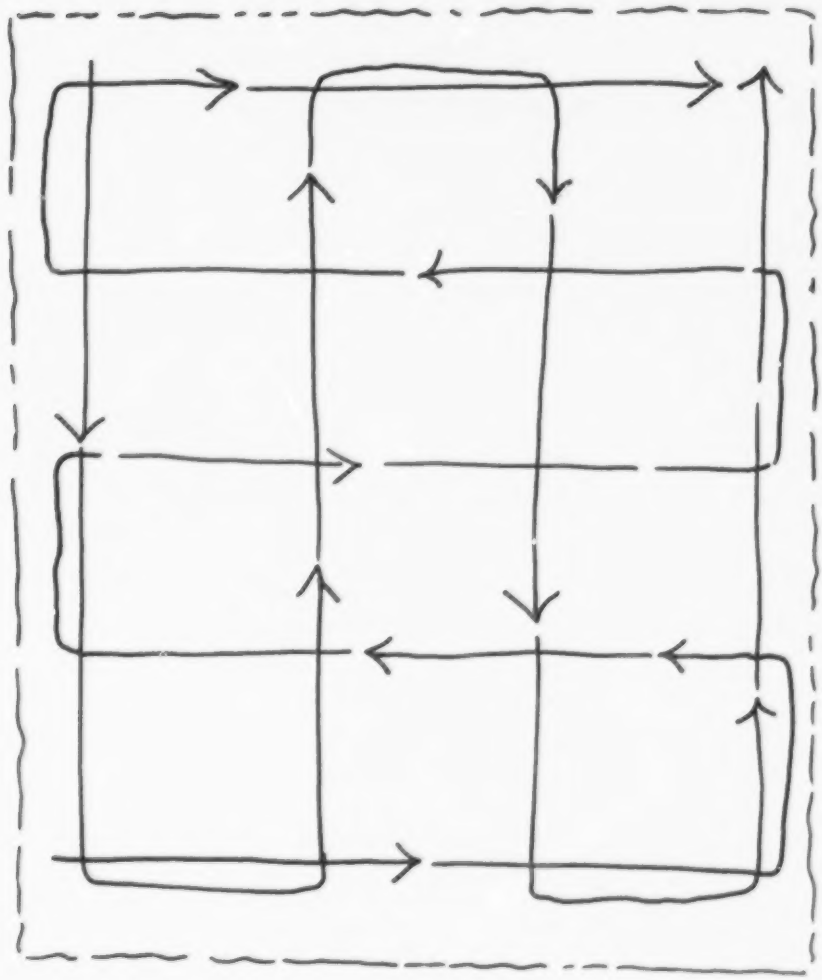
a. Show the 60 minute video, Growing Beautiful Lawns, from Ortho. (It is available from the Missouri Vocational Resource Center, University of Missouri-Columbia, 8 London Hall, Columbia, MO 65211.)
b. Ask an underground sprinkler salesperson to explain how to install sprinkler systems.
c. Have students take a soil test of their lawns, so they will be aware of any nutrient deficiencies.

Seeder/Spreader

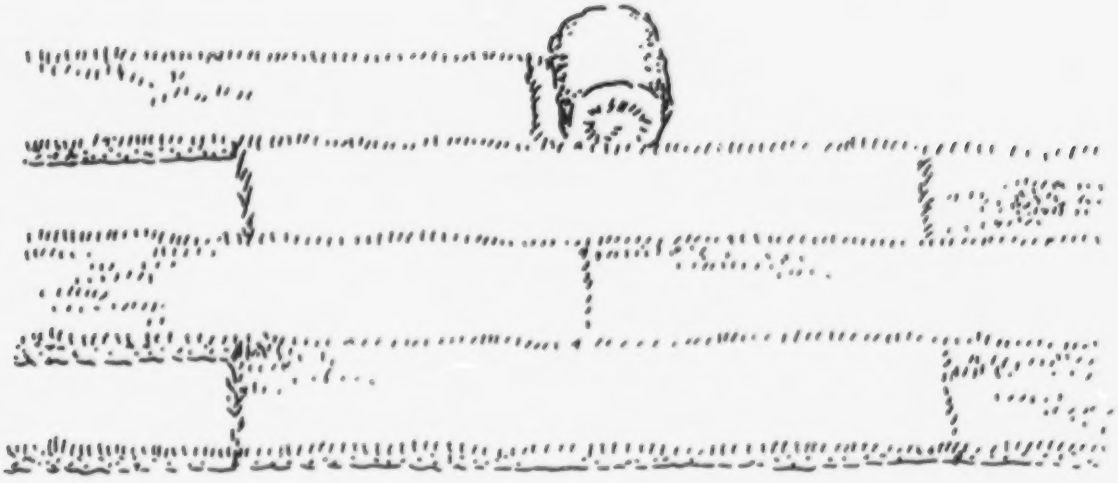
TM 6.1



Seed and Fertilizer Application

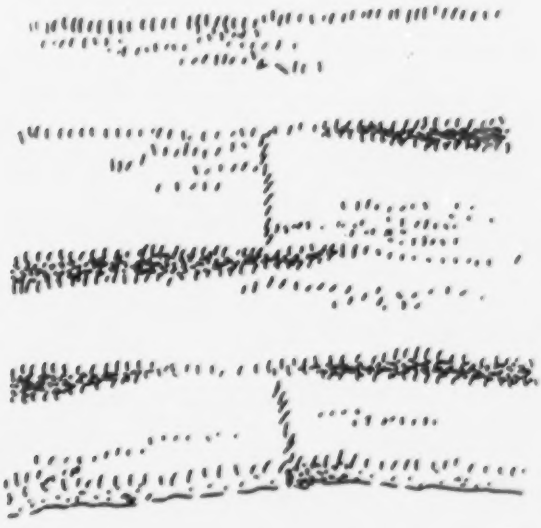


Laying Sod



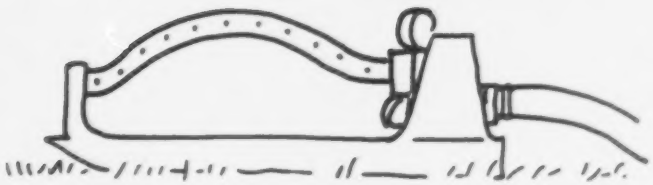
Alternate rolls of sod to help tie them together.

Don't overlap sod. Both the top and bottom layer will die.

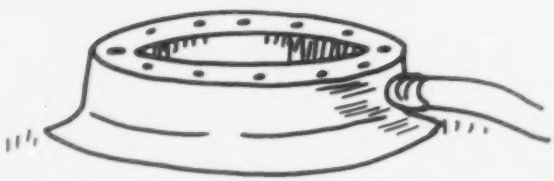


Don't leave gaps between the rolls. Gaps give the lawn a rough appearance and cause the sod to dry out.

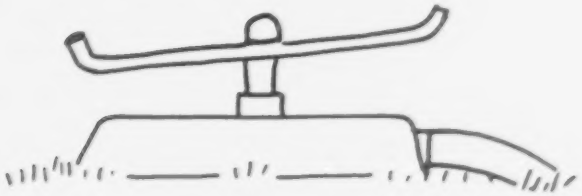
Watering Systems



Oscillating



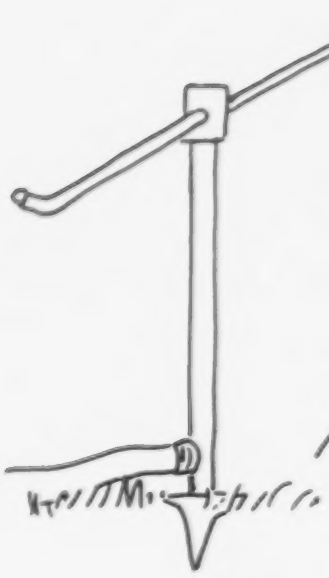
Spray



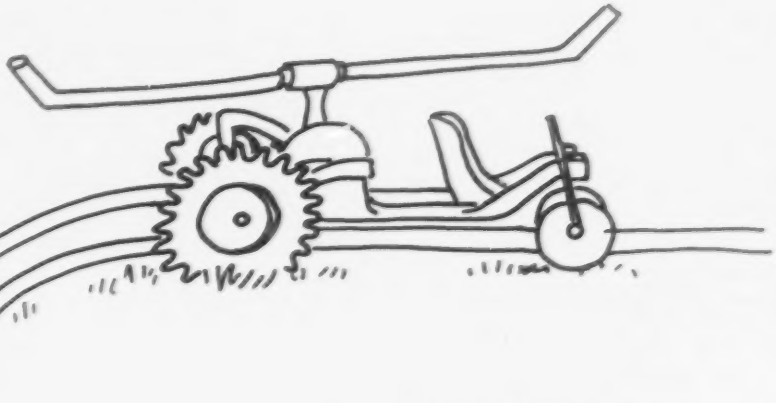
Rotary

Impulse

Soaker Hose



Rotary

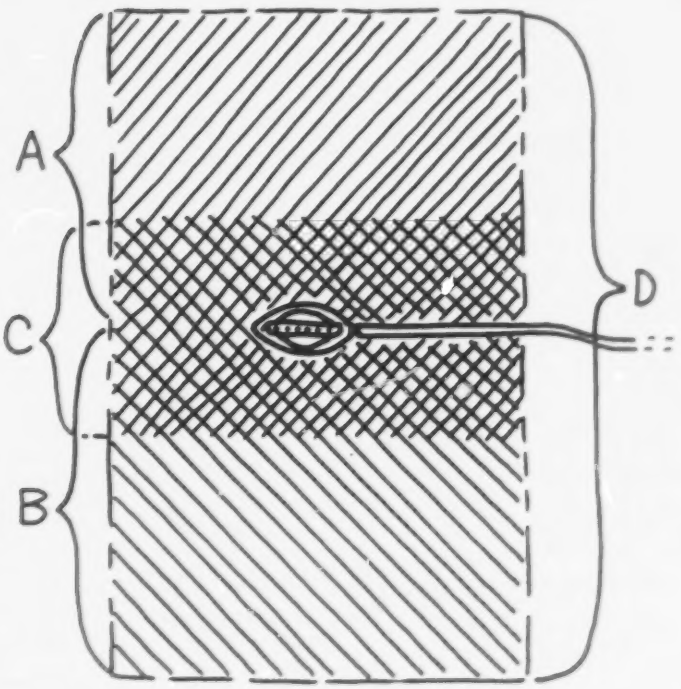


Rotary Head
Rain Train

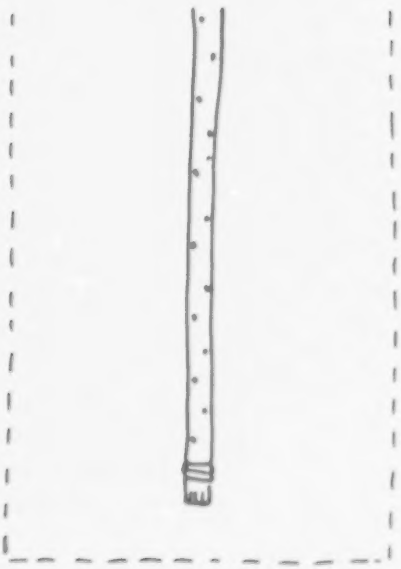
Watering Patterns

Oscillating Head

A & B - watering just one side
C - watering a small area in the middle
D - watering the whole area

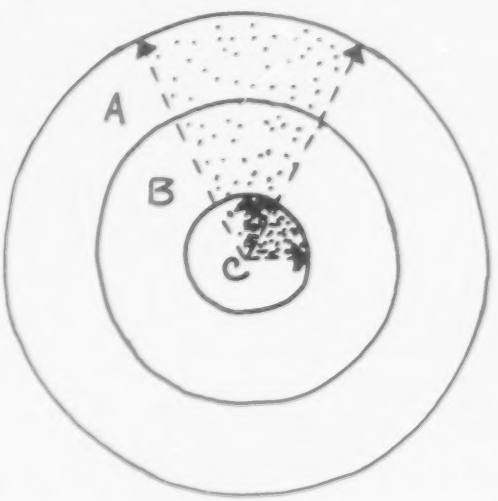


Soaker Hoses

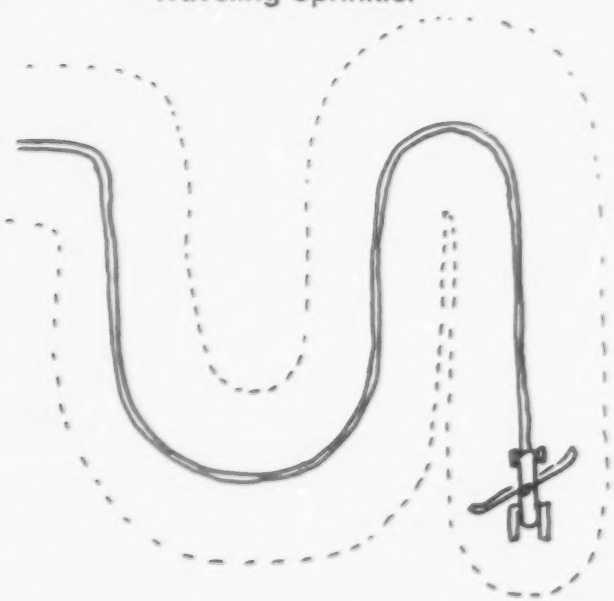


Spray Patterns

A - Impulse heads spray the most distance, but the distance can be adjusted. They can spray any portion of a circle.
B - Rotary heads spray in complete circles.
C - Spray heads can be adjusted for portions of circles.

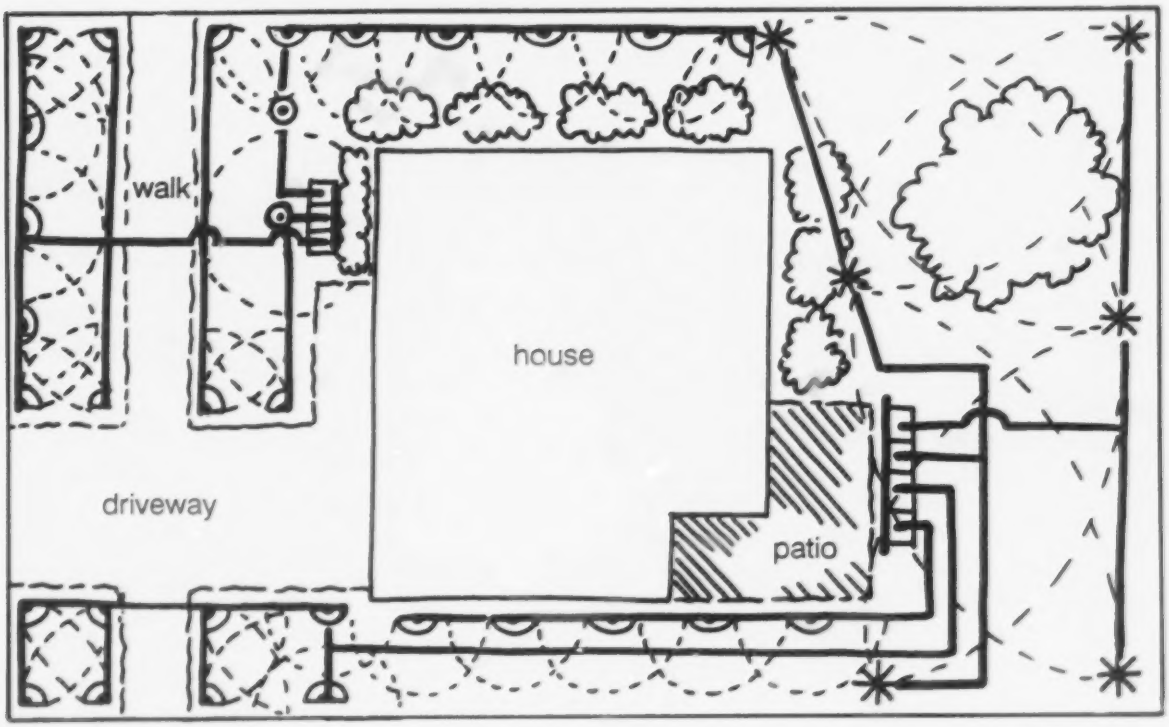


Traveling Sprinkler



Underground Sprinkler System

TM 6.6



Pipe

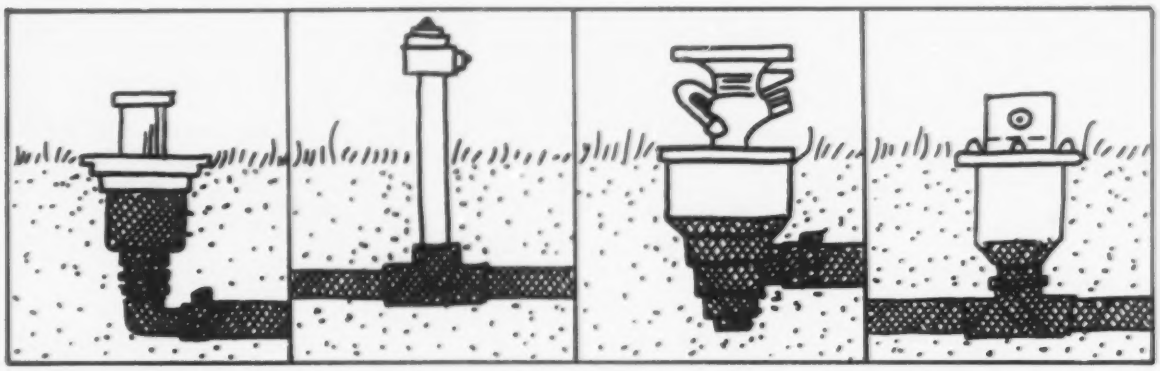
Rotary Spray Head

Full Circle Spray Head

Half Circle Spray Head

Quarter Circle Spray Head

Sprinkler Coverage



Lesson 6: Lawn Care

OUTLINE

1. Turf varieties
    a. Considerations in selecting lawn grasses
        1) Weather conditions
            (a) Temperature extremes
            (b) Moisture
            (c) Shade
        2) Level of maintenance
        3) Quality of lawn
    b. Turf variety characteristics
        1) Cool-season grasses
        2) Warm-season grasses
2. Lawn establishment
    a. Seeding
        1) Seed bed preparation
        2) Grass selection
        3) Sowing the seed
        4) Mulching
        5) Watering
        6) First mowing
        7) Weed control
    b. Sodding
        1) Seed bed preparation
        2) Variety selection
        3) Ordering sod
        4) Sod installation

5) Watering

6) First mowing

3. Lawn renovation (overseeding)

a. Why overseed your lawn?

b. Why did the lawn decline?

1) Soil problem

2) Maintenance problem

3) Pest problem

c. Preparing the seed bed

d. Seeding

e. Watering

4. Mowing your lawn

a. Proper frequency and height

b. Lawn mowers

5. Aeration and thatch removal

6. Watering

a. Frequency

b. Amount of watering

c. Time of day to water

d. Watering systems

1) Soaker hoses

2) Sprinklers

3) Underground sprinklers

7. Fertilization

a. Benefits of fertilization

b. What nutrients do lawns need?

1) Three major elements

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2) Fertilizer analysis to be used

c. Fertilizing cool-season lawns

d. Fertilizing warm-season lawns

e. Fertilizer application

f. Lime application

8. Turf pests

a. Weeds

b. Turf insects

c. Turf diseases